AREA 317
RCRA QUARTERLY GROUND WATER QUALITY MONITORING REPORT NO. 18
JANUARY THROUGH MARCH 1993

April 15, 1993

WHITTAKER CORPORATION
BERMITE DIVISION
22116 West Soledad Canyon Road
Santa Clarita, California 91350

ACTON • MICKELSON • van DAM, INC.
Consulting Scientists, Engineers, and Geologists

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April 15, 1993

Mr. Alan Sorsher, P.E.
California Environmental Protection Agency
Department of Toxic Substances Control
1011 N. Grandview Avenue
Glendale, California 91201

WHI01.38

Subject: Area 317 RCRA Ground Water Sampling
Eighteenth Quarterly Report, January - March 1993
Whittaker Corporation, Bermite Division

Dear Mr. Sorsher:

In accordance with the RCRA Closure Plan for Whittaker Corporation, Bermite Division, enclosed is a copy of the Area 317 Eighteenth Quarterly Ground Water Sampling Report. This report presents the sampling and analysis results of those parameters analyzed both during this quarter and all prior quarterly sampling events.

A statistical analysis of the indicator parameters (pH, conductivity, total organic carbon, and total organic halogens) analyzed in ground water samples collected from monitoring wells in Area 317 is presented in the enclosed report. The analysis compared the results of the downgradient monitoring wells to the upgradient (background) monitoring wells. The statistical analysis does not show any statistically significant difference between the downgradient and background wells at Area 317 for any of the four indicator parameters, with the exception of conductivity in monitoring well MW-10. The statistically significant difference in conductivity in monitoring well MW-10 is believed to be an artifact of the statistical method used. Conductivity in both upgradient wells (MW-1 and MW-3) was greater than conductivity in monitoring well MW-10 as measured during this eighteenth quarterly monitoring report.

If you have any questions regarding this report, please call me at (916) 939-7550.

Sincerely,

ACTON • MICKELSON • van DAM, INC.

Barbara J. Mickelson

Barbara J. Mickelson, P.E.
President

BJM:mjd
Enclosure

cc/enc: Mr. Edward Muller, Whittaker Corporation
Mr. Glen AbdunNur, Whittaker Corporation, Bermite Division
Ms. Lili Hershkovitz, U.S. Environmental Protection Agency
Mr. Jim Ross, Los Angeles Regional Water Quality Control Board

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1.0 INTRODUCTION

The Whittaker Corporation, Bermite Division (Whittaker) facility (site) is located at 22116 West Soledad Canyon Road in Santa Clarita, California (Figure 1). At the time operations were terminated in April 1987, Whittaker had interim status permits for 14 Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Units (HWMUs) at the site. A document entitled "Whittaker Corporation, Bermite Division, Santa Clarita, CA CAD064573108, Facility Closure Plan Modifications" (Closure Plan), was prepared by Whittaker and approved by the California Environmental Protection Agency, Department of Toxic Substances Control (Cal-EPA) and U.S. Environmental Protection Agency (U.S. EPA) on December, 28, 1987. Outlined in the Closure Plan are procedures for obtaining approval by Cal-EPA and U.S. EPA of clean closure certification for the different HWMUs, including the 317 Surface Impoundment (Area 317).

Required in the Closure Plan is the implementation of a ground water monitoring system at Area 317 capable of detecting and assessing the impact of the HWMU on the uppermost aquifer at the site. Implementation of a ground water monitoring system is described in the document entitled "Specific Plan for a Ground Water Quality Assessment Program for the 317 Surface Impoundment Area," dated September 12, 1991 (Area 317 Plan).

A total of six ground water monitoring wells (MW-1, MW-3, MW-4, MW-5, MW-6, and MW-10) have been installed around Area 317 (Figure 2). Several reports detailing the location and construction of monitoring wells, sampling and analysis plan for collecting and analyzing ground water samples from the ground water monitoring wells, abandonment of monitoring well MW-4, and quarterly sampling results which have been submitted to Cal-EPA and U.S. EPA are listed in Appendix A of this report.

Quarterly ground water sampling activities were initiated on October 3, 1988, for monitoring wells MW-1, MW-3, and MW-4. The ground water monitoring program includes analyses of water samples for volatile organic compounds (VOCs). Laboratory analytical results from the third quarterly sampling event reported trichloroethene (TCE) at 4,800 micrograms per liter (μg/l) in the ground water sample collected from monitoring well MW-4. As a result of this detection of TCE in the sample from monitoring well MW-4, two additional monitoring wells were installed in Area 317 (MW-5 and MW-6).

The fourth quarterly monitoring event included sampling of the ground water from monitoring wells MW-1, MW-3, and MW-4. Monitoring wells MW-5 and MW-6 were not equipped for sampling during the fourth quarterly sampling event. Analytical results from the fourth quarter were similar to those reported in the third quarterly sampling event. The concentrations of VOCs reported in samples collected from monitoring wells MW-1 and MW-3 were below laboratory reporting limits; however, analysis of the ground water sample collected from monitoring well MW-4 reported TCE at 7,200 $\mu g/l$. Analysis of ground water samples collected from monitoring well MW-4 during the fifth through twelfth quarterly sampling events reported a steady decline in TCE concentration. Based on the results of the initial four sampling events, a reduced list of chemical parameters was approved by Cal-EPA for the fifth and subsequent quarterly sampling events.

Five ground water monitoring wells (MW-1, MW-3, MW-5, MW-6, and MW-10) are currently located around Area 317 (Figure 2). The abandonment of monitoring well MW-4, which took place on May 26 through May 28, 1992, was documented in the report entitled "Area 317 RCRA Quarterly Ground Water Quality Monitoring Report No. 14." Also documented in the above-referenced report is the installation of monitoring well MW-10, which serves as a replacement for monitoring well MW-4. Ground water samples for the eighteenth quarterly sampling event from the Area 317 monitoring wells were collected on January 27, 1993.

Statistical analysis of indicator parameters was also initiated during the fifth quarterly sampling event. The ground water samples collected and analyzed for indicator parameters from monitoring wells MW-1, MW-3 and MW-4 for the initial year of monitoring were evaluated to assess whether statistically significant changes to the ground water had occurred as a result of site activities.

A Comprehensive Ground Water Monitoring Evaluation (CME) was conducted by Cal-EPA on January 24 and 25, 1990, during the sixth quarterly monitoring event. Personnel from Cal-EPA were present during all phases of the sixth quarterly monitoring event, from the taking of initial potentiometric surface elevation measurements to the sealing of the coolers containing the quarterly ground water samples.

The results of the eighteenth quarterly sampling and analysis event are presented in this report, together with recommendations for future quarterly sampling events.

2.0 GROUND WATER LEVEL MEASUREMENTS

Water level measurements were collected on January 25, 1993, prior to well evacuation and sampling activities. Monitoring well locations with respect to Area 317 are shown on Figure 2. Water levels were measured to the nearest 0.01 foot.

Water level elevations have decreased 63.02, 63.90, 48.80, and 49.51 feet in monitoring wells MW-1, MW-3, MW-5, and MW-6, respectively, since the initiation of RCRA ground water monitoring activities at Area 317. Water level elevations have decreased 6.28 feet in monitoring well MW-10 since it was installed. Water level elevations increased 0.92, 1.03, 2.17, 1.51, and 1.52 feet in monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10, respectively, between the seventeenth and eighteenth quarters. Table 1 summarizes potentiometric elevation data for monitoring wells in Area 317. Figure 3 graphically illustrates potentiometric surface elevations in monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10.

A local ground water flow direction for January 25, 1993, has been estimated utilizing the potentiometric elevation data collected that day. Figure 2 illustrates the estimated potentiometric surface contours and the resultant estimated flow direction for January 25, 1993, which is toward the north. Based upon this data, monitoring wells MW-5, MW-6, and MW-10 are estimated to be located hydraulically downgradient from the former Area 317, and monitoring wells MW-1 and MW-3 are estimated to be located hydraulically upgradient from the former Area 317. The ground water flow direction estimated for January 25, 1993, is generally similar to the flow direction estimate presented for the previous sampling event.

3.0 SAMPLE COLLECTION AND ANALYSES

Ground water evacuation, stabilization, and sampling procedures are outlined in Appendix B.

3.1 Required Ground Water Analyses

A reduced analytical parameter testing list was approved by Cal-EPA after submittal of "Quarterly Sampling Report No. 4." As of the fifth quarter, ground water samples from monitoring wells MW-1 and MW-3 were analyzed for the following: sulfates, chlorides, total phosphate, pH, specific conductance, total organic carbon (TOC), total organic halogens (TOX), and dissolved metals (antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, and thallium) by EPA-approved methods. Ground water samples collected from monitoring wells MW-5, MW-6, and MW-10 were analyzed for pH, specific conductance, TOC, TOX, and VOCs by EPA-approved methods.

For the January - March 1993 sampling event, the following analytical parameters were tested:

- Indicator Parameters: pH, specific conductance, TOC, and TOX.

- Ground Water Quality Parameters: phenols, pesticides (endrin, lindane, methoxychlor, toxaphene, 2,4-D, and 2,4,5-TP), radium, gross alpha, gross beta, coliform bacteria, nitrate, sulfate, phosphate, sodium, chloride, fluoride, and dissolved metals (arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, and silver). Samples from monitoring wells MW-1 and MW-3 were not analyzed for nitrate, sodium, iron, and manganese.

- Hazardous Constituent Parameters: VOCs, semivolatile organic compounds (SVOCs), formaldehyde, and dissolved metals (antimony, copper, and thallium).

All ground water samples collected as part of the eighteenth sampling event were submitted to FGL in Santa Paula, California. FGL is certified by Cal-EPA to perform the ground water analyses outlined in the Closure Plan. Chain-of-custody and sample analysis request forms are included in Appendices C and D, respectively.

A description of FGL's Quality Assurance/Quality Control (QA/QC) program is provided in Appendix E. Copies of the laboratory analytical reports for all trip, field, and method blanks, and duplicate and spiked samples analyzed by FGL are provided in Appendix F.

3.2 Approved Analytical Methods

Indicator, ground water quality, and hazardous constituent parameters were analyzed by EPA or other approved methodologies. Analytical methodologies were presented in the "Ground Water Sampling and Analysis Plan," dated August 1988. Modifications to this plan were approved by Cal-EPA prior to the fifth quarterly sampling event. Copies of the laboratory test method protocol were included in Appendix B of "Quarterly Sampling Report No. 1," dated December 1988.

A summary of sample volumes, sample containers, and laboratory analytical methods utilized during the eighteenth sampling event is presented in Table B-3, Appendix B. Procedures regarding sample containers, sample labeling, sample collection, and field QA/QC are outlined in Appendix B.

4.0 GROUND WATER SAMPLE ANALYTICAL RESULTS

4.1 Indicator Parameters

Four replicate ground water samples from each monitoring well were analyzed for pH, specific conductance, TOC, and TOX to serve as indicator parameters. Table 2 summarizes the results of the indicator parameter analyses. Copies of the original laboratory data sheets are presented in Appendix G.

Laboratory pH measurements of 7.6 to 7.7, 7.6, 7.8 to 7.9, and 8.0 were recorded for samples collected from monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10, respectively, for the eighteenth sampling event. The laboratory pH measurements recorded for samples collected from the monitoring wells during the eighteenth sampling event were generally consistent with the measurements recorded during previous sampling events.

Specific conductance measurements of 706 to 708, 637 to 643, 532 to 537, 542 to 546, and 631 to 635 micromhos per centimeter (μmhos/cm) were recorded for samples collected from monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10, respectively, for the eighteenth sampling event. The specific conductance measurements recorded during the eighteenth sampling event were consistent with measurements recorded during previous sampling events.

Total organic carbon was reported at <0.5 milligrams per liter (mg/l) in all samples collected from Area 317 monitoring wells during the eighteenth sampling event. The TOC measurements recorded during the eighteenth sampling event were consistent with measurements recorded during previous sampling events.

Total organic halogens were reported at <5.0 μg/l in all but three samples collected from the Area 317 monitoring wells; one sample each from monitoring wells MW-1 (8.0 μg/l, MW-5 (5 μg/l), and MW-6 (6 μg/l). The TOX measurements recorded for samples collected from monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10 during the eighteenth sampling event were consistent with measurements recorded during previous sampling events.

Copies of the laboratory analytical reports for the indicator parameters are included in Appendix G.

4.2 Ground Water Quality Parameters

Laboratory analysis reported dissolved metals (arsenic, barium, cadmium, copper, iron, lead, manganese, mercury, selenium, and silver), phenols, pesticides, and coliform bacteria at less than the respective detection limits in samples from the five monitoring wells. The January - March 1993 analytical results for dissolved metals for monitoring wells MW-1 and MW-3 were consistent with previous sampling events and are presented in Table 3. Beginning with the fifth sampling event, monitoring wells MW-1 and MW-3 were the only two monitoring wells from which samples had been analyzed for dissolved metals.

Chloride concentrations ranged from 30 mg/l in the sample from monitoring well MW-3 to 137 mg/l in the sample from monitoring well MW-1. Sulfate concentrations ranged from 6 mg/l in the sample from monitoring well MW-1 to 69 mg/l in the sample from monitoring well MW-3. Phosphorus was reported at <0.1 mg/l in the samples from all five monitoring wells. The chloride, sulfate, and phosphorus results were consistent with the results reported from previous sampling events (Table 4). Fluoride concentrations ranged from 0.2 to 0.3 mg/l in the samples from the five monitoring wells.

Samples from monitoring wells MW-5, MW-6, and MW-10 were analyzed for nitrate, sodium, iron, and manganese. Nitrate concentrations ranged from 0.5 mg/l in the sample from monitoring well MW-10 to 2.4 mg/l in the sample from monitoring well MW-6. Sodium concentrations ranged from 45 mg/l in the sample from monitoring well MW-6 to 82 mg/l in the sample from monitoring well MW-10. Iron and manganese were reported at <0.05 and <0.03 mg/l, respectively, in the samples from MW-5, MW-6, and MW-10. Samples from monitoring wells MW-1 and MW-3 were not analyzed for nitrate, sodium, iron, and manganese during the eighteenth sampling event.

Gross alpha in samples from the five monitoring wells ranged from 0 ± 1 picocuries per liter (pC/l) (monitoring well MW-1) to 0.8 ± 1 pC/l (monitoring well MW-3). Gross beta in samples from the five monitoring wells ranged from 0.7 ± 2 pC/l (monitoring well MW-5) to 4 ± 2 pC/l (monitoring well MW-1). Total radium in samples from the five monitoring wells ranged from 0 ± 1 pC/l (monitoring well MW-10) to 0.7 pC/l (monitoring well MW-1).

Copies of the laboratory analytical reports for the ground water quality parameters are included in Appendix G.

4.3 Hazardous Constituent Parameters

Antimony, copper, and thallium were reported at less than the respective detection limit in samples collected from all five monitoring wells. The results of the dissolved metals analysis for the samples from monitoring wells MW-1 and MW-3 are presented in Table 3, and are consistent with the results reported during previous sampling events. Samples from the other monitoring wells had not been tested for these dissolved metals since the fourth sampling event. In addition, formaldehyde was reported at less than the detection limit in samples from all five monitoring wells.

All VOCs and SVOCs were reported at less than the respective detection limits in samples from all five monitoring wells. These results for samples from monitoring wells MW-5, MW-6, and MW-10 were consistent with previous sampling events. Samples from monitoring wells MW-1 and MW-3 had not been analyzed for VOCs and SVOCs since the fourth sampling event.

Copies of the laboratory analytical reports for the hazardous constituent parameters are included in Appendix G.

5.0 STATISTICAL ANALYSIS OF RESULTS TO DATE

As indicated in the "Ground Water Sampling and Analysis Plan," dated August 1988, and as required in 40 CFR Part 265.92, statistical analyses of the indicator parameters have been performed to determine whether there is a statistically significant difference in the water quality between the individual downgradient monitoring wells and the upgradient or background monitoring wells. Monitoring wells MW-1 and MW-3 are considered upgradient monitoring wells in relation to Area 317, and monitoring wells MW-5, MW-6, and MW-10 are considered downgradient monitoring wells in relation to Area 317.

After four quarters of sampling and analysis of the monitoring system, the mean, standard deviation, variance, and coefficient of variance of the four indicator parameters were calculated. These values were reported to Cal-EPA in correspondence to Alan Sorsher from Wenck, dated October 25, 1989. The statistical analysis, presented in the fifth through tenth quarterly sampling reports, indicated only one statistically significant difference in water quality as determined by the indicator parameters. This was interpreted by Wenck to be caused by erroneous TOC results from the sixth quarter. The indicator parameter statistics from background monitoring wells MW-1 and MW-3 have been updated to include the eighteenth quarter sampling results. These statistics were then compared to the indicator parameter statistics from the eighteenth quarter for downgradient monitoring wells MW-5, MW-6, and MW-10.

The comparison is the calculation of the averaged-replicate t-test which determines that either "no," there is no statistically significant increase (or decrease for pH) in the indicator parameters from each downgradient monitoring well compared to the upgradient monitoring wells, or that "yes," a statistically significant increase (or decrease for pH) has occurred.

The eighteenth quarter calculated replicate statistics are included in Table H-1, presented in Appendix H. A summary of the quarterly replicate statistics for each monitoring well and the t-test calculations for TOC, TOX, specific conductance, and hydrogen ion concentration (pH) are shown in Appendix H, Tables H-2, H-3, H-4, and H-5, respectively.

5.1 Assumptions Used in the Statistical Analysis

As recommended in the "RCRA Ground Water Monitoring Technical Enforcement Guidance Document," the data points that are less than the detection limit have been given a value equal to one-half the detection limit of the analyte.

Calculation of the comparison test statistic (t_c) was determined by following the procedure presented in 40 CFR 264, Appendix IV. The test statistic for the hydrogen ion concentration was calculated using a 0.05 level of significance for a two-tailed distribution, and the test statistics for the other parameters were calculated using a 0.05 level of significance for a one-tailed distribution. It was assumed that the data are distributed normally.

5.2 Data Preparation

The ground water sample analytical results from the two background or upgradient monitoring wells (MW-1 and MW-3) for all 18 quarters of ground water sampling to date and the four downgradient monitoring wells (MW-4, MW-5, MW-6, and MW-10) for the eighteenth quarter of ground water sampling have been tabulated and prepared for statistical analysis. Four analytes have been used in the statistical analysis: pH, specific conductance, TOC, and TOX.

In accordance with the averaged replicate Students' t-test methodology used for this statistical analysis, the four indicator parameter analytical results, which are sampled and analyzed in quadruplicate each quarter (four replicates), are summarized by quarter and by monitoring well. Four summary statistics have been calculated: arithmetic mean, standard deviation, variance, and coefficient of variance. These quarterly replicate statistics have been calculated such that less than detection limit values are considered to have a value of one-half the detection limit and are presented in Table H-1.

The statistical analysis for the indicator parameters involves testing the null hypotheses regarding the ground water quality downgradient of Area 317, i.e., that there is no statistical difference between the average of all the quarterly statistics for each of the four indicator parameters for background monitoring wells MW-1 and MW-3 compared to the seventeenth quarter statistics for each of the downgradient monitoring wells MW-4, MW-5, MW-6, and MW-10.

The calculations of the average quarterly statistics were performed in the same manner as were the quarterly statistics. The t-statistics (t^* and t_c) were calculated as shown in 40 CFR 264, Appendix IV. The values of t_m and t_b were taken from the table included in 40 CFR 264, Appendix IV. An example calculation is included in Appendix H.

Note that the pH values have been transformed into their resulting hydrogen ion concentrations and that the values of t_m and t_b for the analysis of pH come from the two-tailed probability table.

5.3 Results

The averaged eighteenth quarter replicate results for each indicator parameter at each downgradient monitoring well were compared to the average first through eighteenth quarter replicate results for background monitoring wells MW-1 and MW-3. The statistical analyses indicate that there are no statistically significant differences in hydrogen ion concentration, specific conductance, TOC, or TOX between downgradient and background ground water quality, except for specific conductance in samples from monitoring well MW-10.

Although the specific conductance of the sample obtained during the eighteenth quarterly sampling event from monitoring well MW-10 was statistically higher than the average first through eighteenth quarter background ground water levels, the reported specific conductance (634.00 μmhos/cm) was lower than the two background samples obtained this quarter (706.75

and 639.75 μmhos/cm from monitoring wells MW-1 and MW-3, respectively). Even though the reported specific conductance was statistically higher than background levels, it is unlikely the specific conductance is elevated because the level was lower than the background specific conductance samples collected during the eighteenth quarter.

6.0 SUMMARY

6.1 Ground Water Level Measurements

Based upon the January 25, 1993 data, the estimated direction of ground water flow is toward the north, which is generally consistent with the ground water flow direction estimated during the previous sampling event. Utilizing this data, monitoring wells MW-5, MW-6 and MW-10 are estimated to be located hydraulically downgradient form the former Area 317, and monitoring wells MW-1 and MW-3 are estimated to be located hydraulically upgradient from the former Area 317.

6.2 Indicator Parameters

The pH reported for samples from the five monitoring wells ranged from 7.6 (monitoring wells MW-1 and MW-3) to 8.0 (monitoring well MW-10). The specific conductance of samples from the five monitoring wells ranged from 532 μg/l (monitoring well MW-6) to 708 μg/l (monitoring well MW-1). Total organic carbon was reported at <0.5 mg/l in samples from all five monitoring wells. Total organic halogens were reported at less than 5 μg/l in all but three of the samples from the five monitoring wells; one sample each from monitoring wells MW-1 (8.0 μg/l), MW-5 (5 μg/l), and MW-6 (6 μg/l).

The pH, specific conductance, TOC, and TOX results reported for the eighteenth sampling event were consistent with the results reported for the previous sampling event.

6.3 Ground Water Quality Parameters

Laboratory analysis reported dissolved metals (arsenic, barium, cadmium, copper, iron, lead, manganese, mercury, selenium, and silver), phenols, pesticides, and coliform bacteria at less than the respective detection limits in samples from the five monitoring wells. These results for the samples collected from monitoring wells MW-1 and MW-3 were consistent with the results from previous sampling events. Samples from monitoring wells MW-5, MW-6, and MW-10 had not been analyzed for these dissolved metals since the fourth sampling event.

Chloride, sulfate, and phosphorus concentrations ranged from 30 to 137 mg/l, 6 to 69 mg/l, and <0.01 mg/l, respectively, in samples from the five monitoring wells. These results were consistent with the results from previous sampling events.

Nitrate, sodium, iron, and manganese concentrations ranged from 0.5 to 2.4 mg/l, 45 to 82 mg/l, <0.05 to 0.05 mg/l, and <0.03 mg/l, respectively, in samples from monitoring wells MW-5, MW-6, and MW-10. Samples from monitoring wells MW-1 and MW-3 were not analyzed for these constituents.

Gross alpha, gross beta, and total radium concentrations ranged from 0 ± 1 to 0.8 ± 1 pC/l, 0.7 ± to 4 ± 2 pC/l, and 0 ± 1 pC/l to 0.7 pC/l, respectively, in samples from the five monitoring wells.

6.4 Hazardous Constituent Parameters

All hazardous constituent parameters, including antimony, copper, thallium, formaldehyde, VOCs, and SVOCs were reported at less than the respective detection limits for the current sampling period. These results were consistent with the results reported during the previous sampling event.

6.5 Statistical Analysis

The statistical analyses indicate that there are no statistically significant differences in hydrogen ion concentration, specific conductance, TOC, or TOX between downgradient and background ground water quality, except for specific conductance in samples from monitoring well MW-10. Even though the reported specific conductance was statistically higher than background levels, it is unlikely the specific conductance is elevated because the level was lower than the background specific conductance samples collected during the eighteenth quarter.

7.0 RECOMMENDATIONS

Based upon the data collected, current regulatory guidelines, and the professional judgment of AMV, the following recommendation is presented:

- Conduct future sampling events in accordance with the procedures set forth in the document entitled "Water Quality Monitoring and Response Plan for the Interim Status Area 317 Surface Impoundment."

8.0 REMARKS

The recommendations contained in this report represent our professional opinions. These opinions are based on currently available information and were developed in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

TABLE 1

POTENTIOMETRIC SURFACE ELEVATIONS
RCRA GROUND WATER MONITORING WELLS
WHITTAKER CORPORATION, BERMITE DIVISION

Well No.	MW-1	MW-3	MW-4	MW-5	MW-6	MW-10
Top of Casing Elevation[a]	1,561.32	1,538.51	1,538.43	1,493.37	1,521.09	1,537.49
Date	Potentiometric Surface Elevations[a]					
12/23/87	1,107.81	--[b]				
01/27/88	1,108.03	1,109.51				
02/03/88	1,108.32	1,109.88				
02/04/88	1,108.36	1,109.14				
02/05/88	1,108.36	1,109.17				
02/09/88	1,108.24	1,109.13				
02/10/88	1,108.28	1,109.27				
02/12/88	1,108.28	1,109.27				
02/19/88	1,108.11	1,108.86				
03/28/88	1,107.69	1,108.23				
04/05/88	1,107.76	1,108.23				
04/12/88	1,107.66	1,108.23				
04/19/88	1,107.56	1,108.23				
04/26/88	1,107.61	1,108.23				
05/02/88	1,107.86	1,108.23				
07/27/88	1,103.58	1,104.19	1,102.61			
10/03/88	1,101.75	1,102.11	1,100.77			
01/23/89	1,099.82	1,100.25	1,098.92			
04/17/89	1,097.37	1,097.62	1,096.05			
07/27/89	1,094.67	1,094.85	1,093.53	1,093.02	1,093.15	
08/10/89	1,093.93	1,094.09	1,092.89	1,092.32	1,092.49	
08/18/89	1,093.62	1,093.76	1,092.64	1,092.03	1,092.19	
10/30/89	1,092.07	1,092.16	1,091.08	1,090.62	1,090.64	
01/24/90	1,090.56	1,090.54	1,089.68	1,089.17	1,089.50	
04/16/90	1,088.66	1,088.78	1,087.83	1,087.23	1,087.32	
07/16/90	1,083.56	1,083.53	1,082.29	1,081.41	1,081.85	
10/17/90	1,079.91	1,079.78	1,078.86	1,078.25	1,078.56	
01/28/91	1,076.52	1,076.54	1,075.46	1,074.64	1,074.91	
04/22/91	1,071.22	1,071.29	1,069.75	1,068.90	1,069.25	
07/17/91	1,063.63	1,063.79	1,061.66	1,060.53	1,061.14	
10/08/91	1,055.22	1,055.41	1,053.28	1,052.12	1,052.69	
01/29/92	1,051.88	1,052.29	1,050.63	1,049.76	1,050.06	1,050.57
04/20/92	1,050.47	1,050.88	1,049.33	1,048.78	1,048.92	1,049.37
07/28/92	1,046.84	1,047.40	--[c]	1,045.14	1,045.20	1,045.77
10/19/92	1,043.87	1,044.58	--[c]	1,042.05	1,042.13	1,042.77
01/25/93	1,044.79	1,045.61	--[c]	1,044.22	1,043.64	1,044.29

[a]NGVD = National Geodetic Vertical Datum.
[b]Measurement not recorded.
[c]Monitoring well abandoned 05/28/92.

TABLE 2

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (μmhos/cm)	TOC (mg/l)	TOX (μg/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-1	10/04/88	1	7.5	3.16E-08	579	<3	<100
	10/04/88	1	7.5	3.16E-08	617	<3	<100
	10/04/88	1	7.5	3.16E-08	599	<3	<100
	10/04/88	1	7.5	3.16E-08	595	<3	<100
	11/03/88	1					<100
	11/03/88	1					<100
	01/25/89	2	7.5	3.16E-08	567	5	<100
	01/25/89	2	7.5	3.16E-08	585	<3	<100
	01/25/89	2	7.4	3.98E-08	576	<3	<100
	01/25/89	2	7.5	3.16E-08	559	<3	<100
	04/17/89	3	7.2	6.31E-08		<3	<100
	04/17/89	3	7.2	6.31E-08		<3	<100
	04/17/89	3	7.2	6.31E-08		<3	<100
	04/17/89	3	7.2	6.31E-08		<3	<100
	07/27/89	4	7.5	3.16E-08	502	5	<100
	07/27/89	4	7.5	3.16E-08	495	<3	<100
	07/27/89	4	7.4	3.98E-08	502	<3	<100
	07/27/89	4	7.5	3.16E-08	502	<3	<100
	10/31/89	5	7.6	2.51E-08	525	<3	<100
	10/31/89	5	7.6	2.51E-08	539	<3	<100
	10/31/89	5	7.6	2.51E-08	525	<3	<100
	10/31/89	5	7.6	2.51E-08	508	<3	<100
	01/25/90	6	7.4	3.98E-08	580	<3	<100
	01/25/90	6	7.4	3.98E-08	571	<3	<100
	01/25/90	6	7.4	3.98E-08	566	<3	<100
	01/25/90	6	7.4	3.98E-08	564	<3	<100
	04/17/90	7	7.6	2.51E-08	501	<4	<20
	04/17/90	7	7.5	3.16E-08	506	<4	<20
	04/17/90	7	7.5	3.16E-08	506	<4	<20
	04/17/90	7	7.6	2.51E-08	501	<4	<20
	07/17/90	8	8.3	5.01E-09	560	<4	<20
	07/17/90	8	8.2	6.31E-09	560	<4	<20
	07/17/90	8	8.3	5.01E-09	499	<4	<20
	07/17/90	8	8.3	5.01E-09	499	<4	<20
	10/18/90	9	7.3	5.01E-08	544	<1	<100
	10/18/90	9	7.5	3.16E-08	544	<1	<100
	10/18/90	9	7.5	3.16E-08	544	<1	<100
	10/18/90	9	7.3	5.01E-08	544	<1	150
	01/29/91	10	7.5	3.16E-08	583	1.4	<5
	01/29/91	10	7.5	3.16E-08	561	1.4	<5
	01/29/91	10	7.5	3.16E-08	565	1.3	<5
	01/29/91	10	7.5	3.16E-08	581	1.3	<5
	04/23/91	11	7.7	2.00E-08	559	3.4	<5
	04/23/91	11	7.7	2.00E-08	558	1.3	<5
	04/23/91	11	7.7	2.00E-08	559	1.4	<5
	04/23/91	11	7.6	2.51E-08	558	1.2	<5
	07/19/91	12	7.2	6.31E-08	575	1.2	<5
	07/19/91	12	7.3	5.01E-08	576	1.3	<5
	07/19/91	12	7.4	3.98E-08	574	1.3	<5
	07/19/91	12	7.4	3.98E-08	574	1.1	<5
	10/08/91[a]	--	--	--	--	--	--

TABLE 2 (continued)

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (μmhos/cm)	TOC (mg/l)	TOX (μg/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-1	03/13/92	14	7.5	3.16E-08	640	0.67	<5.0
	03/13/92	14	7.5	3.16E-08	638	<0.5	<5.0
	03/13/92	14	7.5	3.16E-08	637	<0.5	<5.0
	03/13/92	14	7.5	3.16E-08	640	<0.5	<5.0
	04/21/92	15	7.5	3.16E-08	643	<0.5	5.6
	04/21/92	15	7.5	3.16E-08	643	<0.5	<5.0
	04/21/92	15	7.5	3.16E-08	642	<0.5	<5.0
	04/21/92	15	7.5	2.51E-08	645	<0.5	<5.0
	07/29/92	16	7.5	3.16E-08	660	<0.5	17.0
	07/29/92	16	7.5	3.16E-08	660	<0.5	<5.0
	07/29/92	16	7.6	2.51E-08	660	<0.5	5.6
	07/29/92	16	7.6	2.51E-08	660	<0.5	<5.0
	10/10/92	17	7.5	3.16E-08	677	<0.5	<5.0
	10/20/92	17	7.5	3.16E-08	677	<0.5	<5.0
	10/20/92	17	7.5	3.16E-08	677	<0.5	<5.0
	10/20/92	17	7.5	3.16E-08	674	<0.5	<5.0
	01/27/93	18	7.6	2.51E-08	706	<0.5	<5.0
	01/27/93	18	7.7	2.00E-08	708	<0.5	<5.0
	01/27/93	18	7.7	2.00E-08	706	<0.5	<5.0
	01/27/93	18	7.7	2.00E-08	707	<0.5	8.0

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-3	10/04/88	1	7.4	3.98E-08	697	<3	485
	10/04/88	1	7.5	3.16E-08	677	<3	410
	10/04/88	1	7.5	3.16E-08	730	<3	500
	10/04/88	1	7.5	3.16E-08	691	<3	<100
	11/03/88	1					<100
	11/03/88	1					<100
	01/25/89	2	7.8	1.58E-08	681	<3	<100
	01/25/89	2	7.6	2.51E-08	681	<3	<100
	01/25/89	2	7.6	2.51E-08	669	<3	<100
	01/25/89	2	7.9	1.26E-08	624	<3	<100
	04/17/89	3	7.3	5.01E-08		<3	<100
	04/17/89	3	7.3	5.01E-08		<3	<100
	04/17/89	3	7.3	5.01E-08		<3	<100
	04/17/89	3	7.3	5.01E-08		<3	<100
	07/27/89	4	7.5	3.16E-08	661	<3	<100
	07/27/89	4	7.5	3.16E-08	661	<3	<100
	07/27/89	4	7.5	3.16E-08	661	<3	<100
	07/27/89	4	7.5	3.16E-08	661	<3	<100
	10/31/89	5	7.5	3.16E-08	617	<3	<100
	10/31/89	5	7.5	3.16E-08	615	<3	<100
	10/31/89	5	7.5	3.16E-08	617	<3	<100
	10/31/89	5	7.6	2.51E-08	620	<3	<100
	01/25/90	6	7.1	7.94E-08	641	8	<100
	01/25/90	6	7.2	6.31E-08	645	<3	<100
	01/25/90	6	7.2	6.31E-08	645	8	<100
	01/25/90	6	7.2	6.31E-08	634	11	<100
	04/17/90	7	7.3	5.01E-08	588	<4	<20
	04/17/90	7	7.3	5.01E-08	596	<4	<20
	04/17/90	7	7.3	5.01E-08	590	<4	<20
	04/17/90	7	7.4	3.98E-08	586	<4	<20
	07/17/90	8	8.3	5.01E-09	614	<4	<20
	07/17/90	8	8.3	5.01E-09	580	<4	<20
	07/17/90	8	8.2	6.31E-09	580	<4	<20
	07/17/90	8	8.1	7.94E-09	580	<4	<20
	10/18/90	9	7.6	2.51E-08	642	<1	<100
	10/18/90	9	7.6	2.51E-08	642	1.2	<100
	10/18/90	9	7.6	2.51E-08	642	<1	<100
	10/18/90	9	7.7	2.00E-08	642	<1	<100
	01/29/91	10	7.2	6.31E-08	655	2.4	<5
	01/29/91	10	7.3	5.01E-08	660	2.3	<5
	01/29/91	10	7.3	5.01E-08	655	2.2	<5
	01/29/91	10	7.3	5.01E-08	655	1.8	<5
	04/23/91	11	7.6	2.51E-08	630	1.4	<5
	04/23/91	11	7.5	3.16E-08	630	1.5	<5
	04/23/91	11	7.5	3.16E-08	629	3.6	<5
	04/23/91	11	7.6	2.51E-08	628	1.6	<5
	07/19/91	12	7.1	7.94E-08	636	1.3	<5
	07/19/91	12	7.2	6.31E-08	630	1.3	<5
	07/19/91	12	7.3	5.01E-08	635	1.1	<5
	07/19/91	12	7.3	5.01E-08	631	1.4	<5
	10/09/91	13	7.6	2.51E-08	642	<0.5	<5
	10/09/91	13	7.6	2.51E-08	643	<0.5	<5
	10/09/91	13	7.7	2.00E-08	640	<0.5	<5
	10/09/91	13	7.7	2.00E-08	642	<0.5	<5

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-3	01/30/92	14	7.5	3.16E-08	651	0.6	<5.0
	01/30/92	14	7.4	3.98E-08	648	0.6	<5.0
	01/30/92	14	7.4	3.98E-08	647	0.6	5.8
	01/30/92	14	7.5	3.16E-08	644	0.6	<5.0
	04/21/92	15	7.5	3.16E-08	643	<0.5	<5.0
	04/21/92	15	7.5	3.16E-08	644	<0.5	<5.0
	04/21/92	15	7.5	3.16E-08	644	<0.5	<5.0
	04/21/92	15	7.5	3.16E-08	643	<0.5	<5.0
	07/29/92	16	7.6	2.51E-08	640	<0.5	<5.0
	07/29/92	16	7.5	3.16E-08	640	<0.5	<5.0
	07/29/92	16	7.5	3.16E-08	650	0.62	<5.0
	07/29/92	16	7.6	2.51E-08	640	<0.5	<5.0
	10/20/92	17	7.5	3.16E-08	642	<0.5	<5.0
	10/20/92	17	7.5	3.16E-08	641	<0.5	<5.0
	10/20/92	17	7.6	2.51E-08	640	<0.5	<5.0
	10/20/92	17	7.6	2.51E-08	640	<0.5	<5.0
	01/27/93	18	7.6	2.51E-08	637	<0.5	<5.0
	01/27/93	18	7.6	2.51E-08	640	<0.5	<5.0
	01/27/93	18	7.6	2.51E-08	643	<0.5	<5.0
	01/27/93	18	7.6	2.51E-08	639	<0.5	<5.0

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-5	10/31/89	5	7.7	2.00E-08	544	<3	<100
	10/31/89	5	7.6	2.51E-08	541	<3	<100
	10/31/89	5	7.6	2.51E-08	544	<3	<100
	10/31/89	5	7.6	2.51E-08	544	<3	<100
	01/25/90	6	7.5	3.16E-08	585	8	<100
	01/25/90	6	7.5	3.16E-08	583	9	<100
	01/25/90	6	7.5	3.16E-08	571	9	<100
	01/25/90	6	7.5	3.16E-08	574	<3	<100
	04/17/90	7	7.6	2.51E-08	509	<4	<20
	04/17/90	7	7.6	2.51E-08	508	<4	<20
	04/17/90	7	7.6	2.51E-08	516	<4	<20
	04/17/90	7	7.6	2.51E-08	514	<4	<20
	07/19/90	8	8.0	1.00E-08	572	<4	<20
	07/19/90	8	8.0	1.00E-08	560	<4	<20
	07/19/90	8	8.0	1.00E-08	542	<4	<20
	07/19/90	8	8.0	1.00E-08	566	<4	<20
	10/18/90	9	7.6	2.51E-08	544	<1	<100
	10/18/90	9	7.7	2.00E-08	544	<1	<100
	10/18/90	9	7.7	2.00E-08	544	<1	<100
	10/18/90	9	7.8	1.58E-08	544	<1	<100
	01/29/91	10	7.6	2.51E-08	545	2.3	<5
	01/29/91	10	7.6	2.51E-08	554	2.3	<5
	01/29/91	10	7.6	2.51E-08	552	2.5	<5
	01/29/91	10	7.6	2.51E-08	556	2.0	<5
	04/23/91	11	7.8	1.58E-08	542	1.4	<5
	04/23/91	11	7.8	1.58E-08	543	1.6	<5
	04/23/91	11	8.1	7.94E-09	544	1.4	<5
	04/23/91	11	8.0	1.00E-08	543	2.0	<5
	07/19/91	12	7.7	2.00E-08	546	1.5	<5
	07/19/91	12	7.7	2.00E-08	548	1.4	<5
	07/19/91	12	7.7	2.00E-08	541	1.3	<5
	07/19/91	12	7.7	2.00E-08	542	1.4	<5
	10/09/91	13	7.9	1.26E-08	547	<0.5	<5
	10/09/91	13	7.9	1.26E-08	550	<0.5	<5
	10/09/91	13	7.9	1.26E-08	547	<0.5	<5
	10/09/91	13	7.9	1.26E-08	548	<0.5	<5

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-5	03/26/92	14	7.8	1.58E-08	539	<0.5	<5.0
	03/26/92	14	7.8	1.58E-08	538	<0.5	<5.0
	03/26/92	14	7.8	1.58E-08	539	<0.5	<5.0
	03/26/92	14	7.8	1.58E-08	539	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	538	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	538	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	538	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	538	<0.5	<5.0
	07/29/92	16	7.7	2.00E-08	540	0.54	<5.0
	07/29/92	16	7.7	2.00E-08	540	<0.5	<5.0
	07/29/92	16	7.7	2.00E-08	540	<0.5	<5.0
	07/29/92	16	7.7	2.00E-08	540	<0.5	7.3
	10/21/92	17	7.8	1.58E-08	535	<0.5	<5.0
	10/21/92	17	7.8	1.58E-08	536	<0.5	<5.0
	10/21/92	17	7.7	2.00E-08	535	<0.5	53
	10/21/92	17	7.7	2.00E-08	535	<0.5	<5.0
	01/27/93	18	7.9	1.26E-08	532	<0.5	<5.0
	01/27/93	18	7.8	1.58E-08	534	<0.5	5
	01/27/93	18	7.8	1.58E-08	536	<0.5	<5.0
	01/27/93	18	7.9	1.26E-08	537	<0.5	<5.0

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-6	10/31/89	5	7.7	2.00E-08	532	<3	<100
	10/31/89	5	7.7	2.00E-08	521	<3	<100
	10/31/89	5	7.7	2.00E-08	522	<3	<100
	10/31/89	5	7.7	2.00E-08	536	<3	<100
	01/25/90	6	7.6	2.51E-08	575	<3	<100
	01/25/90	6	7.8	1.58E-08	575	<3	<100
	01/25/90	6	7.7	2.00E-08	585	<3	<100
	01/25/90	6	7.6	2.51E-08	575	<3	<100
	04/17/90	7	7.7	2.00E-08	506	<4	<20
	04/17/90	7	7.6	2.51E-08	501	<4	<20
	04/17/90	7	7.6	2.51E-08	497	<4	<20
	04/17/90	7	7.6	2.51E-08	509	<4	<20
	07/19/90	8	7.9	1.26E-08	537	<4	<20
	07/19/90	8	7.9	1.26E-08	538	<4	<20
	07/19/90	8	7.9	1.26E-08	535	<4	<20
	07/19/90	8	8.0	1.00E-08	535	<4	<20
	10/18/90	9	7.8	1.58E-08	541	<1	<100
	10/18/90	9	7.7	2.00E-08	541	<1	<100
	10/18/90	9	7.7	2.00E-08	541	<1	<100
	10/18/90	9	7.7	2.00E-08	541	<1	<100
	01/29/91	10	7.6	2.51E-08	530	2.2	<5
	01/29/91	10	7.6	2.51E-08	532	1.9	<5
	01/29/91	10	7.6	2.51E-08	513	2.4	<5
	01/29/91	10	7.6	2.51E-08	538	1.9	<5
	04/23/91	11	7.9	1.26E-08	518	1.8	<5
	04/23/91	11	7.9	1.26E-08	518	1.5	<5
	04/23/91	11	8.1	7.94E-09	519	1.3	<5
	04/23/91	11	8.1	7.94E-09	518	1.3	<5
	07/19/91	12	7.7	2.00E-08	516	1.5	<5
	07/19/91	12	7.7	2.00E-08	519	1.5	<5
	07/19/91	12	7.7	2.00E-08	522	1.6	<5
	07/19/91	12	7.7	2.00E-08	520	1.5	<5
	10/09/91	13	7.9	1.26E-08	528	<0.5	<5
	10/09/91	13	7.9	1.26E-08	528	<0.5	<5
	10/09/91	13	8.0	1.00E-08	525	<0.5	<5
	10/09/91	13	7.9	1.26E-08	528	<0.5	<5

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-6	01/30/92	14	7.6	2.51E-08	534	<0.5	9.8
	01/30/92	14	7.6	2.51E-08	534	0.9	8.1
	01/30/92	14	7.6	2.51E-08	535	<0.5	11.1
	01/30/92	14	7.6	2.51E-08	537	<0.5	12.9
	04/21/92	15	7.7	2.00E-08	532	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	531	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	532	<0.5	<5.0
	04/21/92	15	7.7	2.00E-08	531	<0.5	<5.0
	07/29/92	16	7.7	2.00E-08	540	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	540	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	540	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	540	<0.5	<5.0
	10/30/92	17	7.7	2.00E-08	542	<0.5	<5.0
	10/30/92	17	7.7	2.00E-08	542	<0.5	<5.0
	10/30/92	17	7.7	2.00E-08	541	<0.5	<5.0
	10/30/92	17	7.7	2.00E-08	540	<0.5	<5.0
	01/27/93	18	7.8	1.58E-08	542	<0.5	<5.0
	01/27/93	18	7.8	1.58E-08	545	<0.5	<5.0
	01/27/93	18	7.9	1.26E-08	544	<0.5	6
	01/27/93	18	7.8	1.58E-08	546	<0.5	<5.0

TABLE 2 - continued

AREA 317 HISTORY OF INDICATOR PARAMETERS IN GROUND WATER MONITORING WELLS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Date	Quarter	pH	Hydrogen Ion Concentration	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit (Quarter 18)						0.5	5.0
MW-10	01/30/92	14	7.8	1.58E-08	624	<0.5	<5.0
	01/30/92	14	7.8	1.58E-08	623	<0.5	<5.0
	01/30/92	14	7.7	2.00E-08	627	<0.5	<5.0
	01/30/92	14	7.8	1.58E-08	627	<0.5	<5.0
	04/21/92	15	7.8	1.58E-08	635	<0.5	<5.0
	04/21/92	15	7.8	1.58E-08	636	<0.5	<5.0
	04/21/92	15	7.8	1.58E-08	636	<0.5	<5.0
	04/21/92	15	7.8	1.58E-08	636	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	640	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	640	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	640	<0.5	<5.0
	07/29/92	16	7.8	1.58E-08	640	<0.5	<5.0
	10/21/92	17	7.8	1.58E-08	627	<0.5	<5.0
	10/21/92	17	7.9	1.26E-08	627	<0.5	<5.0
	10/21/92	17	7.9	1.26E-08	625	<0.5	19
	10/21/92	17	7.9	1.26E-08	626	<0.5	<5.0
	01/27/93	18	8.0	1.00E-08	631	<0.5	<5.0
	01/27/93	18	8.0	1.00E-08	635	<0.5	<5.0
	01/27/93	18	8.0	1.00E-08	635	<0.5	<5.0
	01/27/93	18	8.0	1.00E-08	635	<0.5	<5.0

[a]Not sampled because water elevation dropped below elevation of sampling pump intake.

Legend: µmhos/cm = micromhos per centimeter
TOC = total organic carbon
mg/l = milligrams per liter
TOX = total organic halogens
ug/l = micrograms per liter

TABLE 3

AREA 317 DISSOLVED METALS WATER QUALITY HISTORY--BERMITE DIVISION, WHITTAKER CORPORATION
Concentrations in micrograms per liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Antimony	Arsenic	Barium	Cadmium	Chromium	Copper
MCL[a]				50	1,000	10	50	
MW-1	10/04/88	1	<100	<10	<100	<1	<10	<50
	01/25/89	2	<100	<10	<100	<1	<10	<50
	04/17/89	3	<100	<10	<100	<1	<10	<50
	07/27/89	4	<100	<10	<100	<1	<10	<50
	10/31/89	5	<100	<10	<100	<1	<10	<50
	01/25/90	6	<1,000	<1,000	<100	<100	<200	<100
	04/17/90	7	<1,000	<1,000	<100	<100	<200	<100
	07/17/90	8	<1,000	<1,000	<100	<100	<200	<100
	10/18/90	9	<100	<10	<100	<1	<10	100
	01/29/91	10	<100	<50	<100	<10	<50	<100
	04/23/91	11	<100	<50	<100	<10	<50	<100
	07/19/91	12	<100	<50	<100	<10	<50	<100
	10/09/91	13[b]	--	--	--	--	--	--
	03/13/92	14	<100	<50	70	<10	<50	<100
	04/21/92	15	<100	<50	70	<10	<50	<100
	07/29/92	16	<100	<50	60	<10	<50	<100
	10/21/92	17	<100	<50	60	<10	<50	<100
	01/27/93	18	<100	<50	<100	<10	<50	<100
MW-3	10/04/88	1	<100	<10	<100	<1	<10	<50
	01/25/89	2	<100	<10	<100	<1	<10	<50
	04/17/89	3	<100	<10	<100	<1	<10	<50
	07/27/89	4	<100	<10	<100	<1	<10	<50
	10/31/89	5	<100	<10	<100	<1	<10	<50
	01/25/90	6	<1,000	<1,000	<100	<100	<200	<100
	04/17/90	7	<1,000	<1,000	<100	<100	<200	<100
	07/17/90	8	<1,000	<1,000	<100	<100	<200	<100
	10/18/90	9	<100	<10	<100	<1	<10	100
	01/29/91	10	<100	<50	<100	<10	<50	<100
	04/23/91	11	<100	<50	<100	<10	<50	<100
	07/19/91	12	<100	<50	<100	<10	<50	<100
	10/09/91	13	<100	<50	<100	<10	<50	<100
	01/30/92	14	<100	<50	320	<10	<50	<100
	04/21/92	15	<100	<50	60	<10	<50	<100
	07/29/92	16	<100	<50	60	<10	<50	<100
	10/21/92	17	<100	<50	50	<10	<50	<100
	01/27/93	18	<100	<50	<100	<10	<50	<100

[a]EPA Primary Drinking Water Standards--Maximum Contaminant Level.
[b]Not sampled because water elevation dropped below elevation of sampling pump intake.

TABLE 3 - continued

DISSOLVED METALS WATER QUALITY HISTORY--BERMITE DIVISION, WHITTAKER CORPORATION
Concentrations in micrograms per liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Lead	Mercury	Nickel	Selenium	Silver	Thallium
MCL[a]			50		2	10	50	
MW-1	10/04/88	1	<10	<1	---[b]	<5	<10	<100
	01/25/89	2	<10	<1	---	<5	<10	<100
	04/17/89	3	<10	<1	---	<5	<10	<100
	07/27/89	4	<10	<1	---	<5	<10	<100
	10/31/89	5	<10	<1	---	<5	---	<100
	01/25/90	6	<800	<1	<100	<2,000	<100	<300
	04/17/90	7	<800	<1	<100	<2,000	<100	<300
	07/17/90	8	<800	<1	<100	<2,000	<100	<300
	10/18/90	9	<10	<1	---	<5	---	<100
	01/29/91	10	<50	<1	---	<10	---	<100
	04/23/91	11	<50	<1	---	<10	---	<100
	07/19/91	12	<50	<1	---	<10	---	<100
	10/09/91	13[c]	--	--	---	--	---	--
	03/13/92	14	<50	<1	---	<10	---	<100
	04/21/92	15	<50	<1	---	<10	---	<100
	07/29/92	16	<50	<1	---	<10	---	<100
	10/21/92	17	<50	<1	---	<10	---	<100
	01/27/93	18	<50	<1	---	<10	<10	<1,000
MW-3	10/04/88	1	<10	<1	---	<5	<10	<100
	01/25/89	2	<10	<1	---	<5	<10	<100
	04/17/89	3	<10	<1	---	<5	<10	<100
	07/27/89	4	<10	<1	---	<5	<10	<100
	10/31/89	5	<10	<1	---	<5	---	<100
	01/25/90	6	<800	<1	<100	<2,000	<100	<300
	04/17/90	7	<800	<1	<100	<2,000	<100	<300
	07/17/90	8	<800	<1	<100	<2,000	<100	<300
	10/18/90	9	<10	<1	---	<5	---	<100
	01/29/91	10	<50	<1	---	<10	---	<100
	04/23/91	11	<50	<1	---	<10	---	<100
	07/19/91	12	<50	<1	---	<10	---	<100
	10/09/91	13	<50	<1	---	<10	---	<100
	01/30/92	14	<50	<1	---	<10	<10	<100
	04/21/92	15	<50	<1	---	<10	---	<100
	07/29/92	16	<50	<1	---	<10	---	<100
	10/21/92	17	<50	<1	---	<10	---	<100
	01/27/93	18	<50	<1	---	<10	<10	<1,000

[a]EPA Primary Drinking Water Standards--Maximum Contaminant Level.
[b]Test not run.
[c]Not sampled because water elevation dropped below elevation of sampling pump intake.

TABLE 4

AREA 317 HISTORY OF GROUND WATER QUALITY PARAMETERS--NUTRIENTS
BERMITE DIVISION, WHITTAKER CORPORATION

Monitoring Well	Date	Quarter	Total Phosphate (mg/l)[a]	SO_4 (mg/l)	Cl_{1-} (mg/l)
MCL[b]			NA[c]	250	250
MW-1	10/04/88	1	<0.1	11	
	01/25/89	2	<0.1	22	
	04/17/89	3	<0.1	11	
	07/27/89	4	<0.1	13	
	10/31/89	5	<0.1	10	83
	01/25/90	6	<0.1	16	85
	04/17/90	7	<0.1	11	88
	07/17/90	8	<0.1	10	82
	10/18/90	9	<0.1	23	98
	01/29/91	10	<0.1	8	96
	04/23/91	11	<0.1	10	100
	07/19/91	12	<0.1	11	97
	10/09/91[d]	13	--	--	--
	03/13/92	14	<0.1	13	131
	04/21/92	15	<0.1	9	130
	07/29/92	16	<0.1	11	133
	10/21/92	17	<0.1	10	138
	01/27/93	18	<0.1	6	137
MW-3	10/04/88	1	<0.1	73	
	01/25/89	2	<0.1	74	
	04/17/89	3	<0.1	9	
	07/27/89	4	<0.1	65	
	10/31/89	5	<0.1	68	35
	01/25/90	6	<0.1	74	36
	04/17/90	7	<0.1	60	46
	07/17/90	8	<0.1	67	39
	10/23/90	9	<0.1	15	34
	01/29/91	10	<0.1	80	54
	04/23/91	11	<0.1	77	34
	07/19/91	12	<0.1	85	45
	10/09/91	13	<0.1	34	37
	01/30/92	14	<0.1	85	33
	04/21/92	15	<0.1	81	37
	07/29/92	16	<0.1	74	33
	10/21/92	17	<0.1	67	34
	01/27/93	18	<0.1	69	30

[a]Milligrams per liter (parts per million - ppm).
[b]EPA Primary Drinking Water Standards--Maximum Contaminant Level.
[c]Not applicable.
[d]Not sampled because water elevation dropped below elevation of sampling pump intake.

TABLE 5

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Acetone	Benzene	Bromo-dichloromethane	Bromoform	Bromomethane
SNARL[a]			700	70	100	100	NSL[b]
MW-1	01/27/88	(1)[c]	<50	<5	<5	<5	<10
	07/29/88	(1)	<50	<5	<5	<5	<10
	08/15/88	(1)	<50	<5	<5	<5	<10
	01/27/88	1	<50	<5	<5	<5	<10
	10/04/88	2	<50	<5	<5	<5	<10
	01/25/89	3	<50	<5	<5	<5	<10
	04/17/89	4	<50	<5	<5	<5	<5
	07/27/89	5	<50	<5	<5	<5	<5
	01/27/93	18	<10	<0.5	<1	<1	<1
MW-3	02/17/88	(1)	<50	<5	<5	<5	<10
	05/27/88	(1)	<50	<5	<5	<5	<10
	07/29/88	(1)	<50	<5	<5	<5	<10
	08/15/88	(1)	<50	<5	<5	<5	<10
	10/04/88	1	<50	<5	<5	<5	<10
	01/25/89	2	<50	<5	<5	<5	<10
	04/17/89	3	<50	<5	<5	<5	<10
	07/27/89	4	<50	<5	<5	<5	<5
	01/27/93	18	<10	<0.5	<1	<1	<1
MW-4	06/15/88	(1)	<50	<5	<5	<5	<10
	07/29/88	(1)	<50	<5	<5	<5	<10
	08/15/88	(1)	<50	<5	<5	<5	<10
	10/04/88	1	<50	<5	<5	<5	<10
	01/25/89	2	<50	<5	<5	<5	<10
	04/17/89	3	<50	<5	<5	<5	<10
	05/17/89	3	<300	<50	<50	<50	<300
	07/27/89	4	<625	<62.5	<62.5	<62.5	<62.5
	10/31/89	5	<50	<5	<5	<5	<5
	01/25/90	6	ND[d]	<12.5	<12.5	<12.5	<12.5
	04/17/90	7	ND	<5.0	<5.0	<5.0	<5.0
	07/17/90	8	--[e]	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	--	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	--	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	--	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	--	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	--	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<100	<5.0	<10	<10	<10
	04/21/92	15	<10.0	<0.5	<1.0	<1.0	<1.0

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Acetone	Benzene	Bromo-dichloromethane	Bromoform	Bromomethane
MW-5	10/31/89	5	<50	<5	<5	<5	<5
	01/25/90	6	ND	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	ND	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	--	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	--	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	--	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	--	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	--	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<10	<0.5	<0.5	<0.5	<0.5
	03/26/92	14	<10.0	<0.5	<1.0	<1.0	<1.0
	04/21/92	15	<10.0	<0.5	<1.0	<1.0	<1.0
	07/28/92	16	<10.0	<0.5	<1.0	<1.0	<1.0
	10/21/92	17	<10.0	<0.5	<1.0	<1.0	<1.0
	01/27/93	18	<10	<0.5	<1	<1	<1
MW-6	10/31/89	5	<50	<5	<5	<5	<5
	01/25/90	6	ND	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	ND	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	--	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	--	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	--	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	--	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	--	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<10	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<10.0	<0.5	<1.0	<1.0	<1.0
	04/21/92	15	<10.0	<0.5	<1.0	<1.0	<1.0
	07/29/92	16	<10.0	<0.5	<1.0	<1.0	<1.0
	10/30/92	17	<10.0	<0.5	<1.0	<1.0	<1.0
	01/27/93	18	<10	<0.5	<1	<1	<1
MW-10	01/30/92	14	<10.0	<0.5	<1.0	<1.0	<1.0
	04/21/92	15	<10.0	<0.5	<1.0	<1.0	<1.0
	07/29/92	16	<10.0	<0.5	<1.0	<1.0	<1.0
	10/21/92	17	<10.0	<0.5	<1.0	<1.0	<1.0
	01/27/93	18	<10	<0.5	<1	<1	<1

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.
[d]Compound not detected.
[e]Not analyzed.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
SNARL[a]			NSL	20	NSL	NSL	100
MW-1	01/27/88	(1)[c]	---	<5	<5	<10	<5
	07/29/88	(1)	---	<5	<5	<10	<5
	08/15/88	(1)	---	<5	<5	<10	<5
	10/04/88	1	---	<5	<5	<10	<5
	01/25/89	2	---	<5	<5	<10	<5
	04/17/89	3	---	<5	<5	<10	<5
	07/27/89	4	---	<5	<5	<5	<5
	01/27/93	18	<5	<0.5	<0.5	<1	<0.5
MW-3	02/17/88	(1)	---	<5	<5	<10	<5
	05/27/88	(1)	---	<5	<5	<10	<5
	07/29/88	(1)	---	<5	<5	<10	<5
	08/15/88	(1)	---	<5	<5	<10	<5
	10/04/88	1	---	<5	<5	<10	<5
	01/25/89	2	---	<5	<5	<10	<5
	04/17/89	3	---	<5	<5	<10	<5
	07/27/89	4	---	<5	<5	<5	<5
	01/27/93	18	<5	<0.5	<0.5	<1	<0.5
MW-4	06/15/88	(1)	---	<5	<5	<10	<5
	07/29/88	(1)	---	<5	<5	<10	<5
	08/15/88	(1)	---	<5	<5	<10	<5
	10/04/88	1	---	<5	<5	<10	<5
	01/25/89	2	---	<5	<5	<10	<5
	04/17/89	3	---	<5	<5	<10	<5
	05/17/89	3	---	<50	<50	<300	<50
	07/27/89	4	---	<62.5	<62.5	<62.5	<62.5
	10/31/89	5	---	<5	<5	<5	<5
	01/25/90	6	---	<12.5	<12.5	<12.5	<12.5
	04/17/90	7	---	<5.0	<5.0	<5.0	<5.0
	07/17/90	8	---	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	---	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	---	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	---	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	---	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	---	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<5.0	<10	<5	<10	<5.0
	04/21/92	15	<5.0	<1.0	<0.5	<1.0	<0.5

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Carbon Disulfide	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform
SNARL[a]			NSL	20	NSL	NSL	100
MW-5	10/31/89	5	---	<5	<5	<5	<5
	01/25/90	6	---	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	---	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	---	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	---	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	---	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	---	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	---	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	---	<0.5	<0.5	<0.5	<0.5
	03/26/92	14	<5.0	<1.0	<0.5	<1.0	<0.5
	04/21/92	15	<5.0	<1.0	<0.5	<1.0	<0.5
	07/28/92	16	<5.0	<1.0	<0.5	<1.0	<0.5
	10/21/92	17	<5.0	<1.0	<0.5	<1.0	<0.5
	01/27/93	18	<5	<0.5	<0.5	<1	<0.5
MW-6	10/31/89	5	---	<5	<5	<5	<5
	01/25/90	6	---	<0.5	<0.5	<0.5	>0.5
	04/17/90	7	---	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	---	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	---	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	---	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	---	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	---	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	---	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<5.0	<1.0	<0.5	<1.0	<0.5
	04/21/92	15	<5.0	<1.0	<0.5	<1.0	<0.5
	07/29/92	16	<5.0	<1.0	<0.5	<1.0	<0.5
	10/30/92	17	<5.0	<1.0	<0.5	<1.0	<0.5
	01/27/93	18	<5	<0.5	<0.5	<1	<0.5
MW-10	01/30/92	14	<5.0	<1.0	<0.5	<1.0	<0.5
	04/21/02	15	<5.0	<1.0	<0.5	<1.0	<0.5
	07/29/92	16	<5.0	<1.0	<0.5	<1.0	<0.5
	10/21/92	17	<5.0	<1.0	<0.5	<1.0	<0.5
	01/27/93	18	<5	<0.5	<0.5	<1	<0.5

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter (μg/l)

Monitoring Well	Date	Quarter	Chloro-methane	Dibromo-chloro-methane	1,2-Dichloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene
SNARL[a]			NSL[b]	100	130	130	130
MW-1	01/27/88	(1)[c]	<10	<5	<5	<5	<5
	07/29/88	(1)	<10	<5	<5	<5	<5
	08/15/88	(1)	<10	<5	<5	<5	<5
	10/04/88	1	<10	<5	<5	<5	<5
	01/25/89	2	<10	<5	<5	<5	<5
	04/17/89	3	<10	<5	<5	<5	<5
	07/27/89	4	<5	<5	<5	<5	<5
	01/27/93	18	<1	<1	<1	<1	<1
MW-3	02/17/88	(1)	<10	<5	<5	<5	<5
	05/27/88	(1)	<10	<5	<5	<5	<5
	07/29/88	(1)	<10	<5	<5	<5	<5
	08/15/88	(1)	<10	<5	<5	<5	<5
	10/04/88	1	<10	<5	<5	<5	<5
	01/25/89	2	<10	<5	<5	<5	<5
	04/17/89	3	<10	<5	<5	<5	<5
	07/27/89	4	<5	<5	<5	<5	<5
	01/27/93	18	<1	<1	<1	<1	<1
MW-4	06/15/88	(1)	<10	<5	<5	<5	<5
	07/29/88	(1)	<10	<5	<5	<5	<5
	08/15/88	(1)	<10	<5	<5	<5	<5
	10/04/88	1	<10	<5	<5	<5	<5
	01/25/89	2	<10	<5	<5	<5	<5
	04/17/89	3	<10	<5	<5	<5	<5
	05/17/89	3	<300	<50	<50	<50	<5
	07/27/89	4	<62.5	<62.5	<62.5	<62.5	<62.5
	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<12.5	<12.5	<12.5	<12.5	<12.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/17/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<10	<10	<10	<10	<10
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
MW-5	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	03/26/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/28/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/21/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Chloro-methane	Dibromo-chloro-methane	1,2-Dichloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene
SNARL[a]			NSL[b]	100	130	130	130
MW-6	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/29/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/30/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1
MW-10	01/30/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/29/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/21/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter (μg/l)

Monitoring Well	Date	Quarter	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane
SNARL[a]			NSL[b]	5	70	270	10
MW-1	01/27/88	(1)[c]	<5	<5	<5	<5	<5
	07/29/88	(1)	<5	<5	<5	<5	<5
	08/15/88	(1)	<5	<5	<5	<5	<5
	10/04/88	1	<5	<5	<5	<5	<5
	01/25/89	2	<5	<5	<5	<5	<5
	04/17/89	3	<5	<5	<5	<5	<5
	07/27/89	4	<5	<5	<5	<5	<5
	01/27/93	18	<1	<1	<1	<1	<1
MW-3	02/17/88	(1)	<5	<5	<5	<5	<5
	05/27/88	(1)	<5	<5	<5	<5	<5
	07/29/88	(1)	<5	<5	<5	<5	<5
	08/15/88	(1)	<5	<5	<5	<5	<5
	10/04/88	1	<5	<5	<5	<5	<5
	01/25/89	2	<5	<5	<5	<5	<5
	04/17/89	3	<5	<5	<5	<5	<5
	07/27/89	4	<5	<5	<5	<5	<5
	01/27/93	18	<1	<1	<1	<1	<1
MW-4	06/15/88	(1)	<5	<5	<5	<5	<5
	07/29/88	(1)	<5	<5	<5	<5	<5
	08/15/88	(1)	<5	<5	<5	<5	<5
	10/04/88	1	<5	<5	<5	<5	<5
	01/25/89	2	<5	<5	<5	<5	<5
	04/17/89	3	<5	<5	<5	<5	<5
	05/17/89	3	<50	<50	<50	<50	<50
	07/27/89	4	<62.5	<62.5	<62.5	<62.5	<62.5
	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<12.5	<12.5	<12.5	<12.5	<12.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/17/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<10	<10	<10	<10	<10
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane
SNARL[a]			NSL[b]	5	70	270	10
MW-5	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	03/26/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/28/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/21/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1
MW-6	10/31/89	5	<5	<5	<5	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	<0.5
	01/30/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/29/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/30/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1
MW-10	01/30/92	14	<1.0	<1.0	<1.0	<1.0	<1.0
	04/21/92	15	<1.0	<1.0	<1.0	<1.0	<1.0
	07/29/92	16	<1.0	<1.0	<1.0	<1.0	<1.0
	10/21/92	17	<1.0	<1.0	<1.0	<1.0	<1.0
	01/27/93	18	<1	<1	<1	<1	<1

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter (μg/l)

Monitoring Well	Date	Quarter	cis-1,3-Dichloro-propene	trans-1,3-Dichloro-propene	Ethanol	Ethyl-benzene	2-Hexanone	Methyl Ethyl Ketone
SNARL[a]			NSL[b]	NSL	NSL	NSL	NSL	750
MW-1	01/27/88	(1)[c]	<5	<5	---	<5	---	<50
	07/29/88	(1)	<5	<5	---	<5	---	<50
	08/15/88	(1)	<5	<5	---	<5	---	<50
	10/04/88	1	<5	<5	---	<5	---	<50
	01/25/89	2	<5	<5	---	<5	---	<50
	04/17/89	3	<5	<5	---	<5	---	<50
	07/27/89	4	<5	<5	---	<5	---	<50
	01/27/93	18	<2	<1	<5,000	<0.5	<5	<10
MW-3	02/17/88	(1)	<5	<5	---	<5	---	<50
	05/27/88	(1)	<5	<5	---	<5	---	<50
	07/29/88	(1)	<5	<5	---	<5	---	<50
	08/15/88	(1)	<5	<5	---	<5	---	<50
	10/04/88	1	<5	<5	---	<5	---	<50
	01/25/89	2	<5	<5	---	<5	---	<50
	04/17/89	3	<5	<5	---	<5	---	<50
	07/27/89	4	<5	<5	---	<5	---	<50
	01/27/93	18	<2	<1	<5,000	<0.5	<5	<10
MW-4	06/15/88	(1)	<10<5	<5	---	<5	---	<5
	07/29/88	(1)	<5	<5	---	<5	---	<5
	08/15/88	(1)	<5	<5	---	<5	---	<5
	10/04/88	1	<5	<5	---	<5	---	<5
	01/25/89	2	<5	<5	---	<5	---	<5
	04/17/89	3	<5	<5	---	<5	---	<5
	05/17/89	3	<50	<50	---	<50	---	<300
	07/27/89	4	<62.5	<62.5	---	<62.5	---	<62.5
	10/31/89	5	<5	<5	---	<5	---	<50
	01/25/90	6	<12.5	<12.5	---	<12.5	---	ND[d]
	04/17/90	7	<5.0	<5.0	---	<5.0	---	ND
	07/17/90	8	<0.5	<0.5	---	<0.5	---	--[e]
	10/18/90	9	<0.5	<0.5	---	<0.5	---	--
	01/29/91	10	<0.5	<0.5	---	<0.5	---	--
	04/23/91	11	<0.5	<0.5	---	<0.5	---	--
	07/19/91	12	<0.5	<0.5	---	<0.5	---	--
	10/09/91	13	<0.5	<0.5	---	<0.5	---	<10
	01/30/92	14	<20	<10	<50,000	<5.0	<5.0	<100
	04/21/92	15	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
MW-5	10/31/89	5	<5	<5	---	<5	---	<50
	01/25/90	6	<0.5	<0.5	---	<0.5	---	ND
	04/17/90	7	<5.0	<5.0	---	<5.0	---	ND
	07/19/90	8	<0.5	<0.5	---	<0.5	---	--
	10/18/90	9	<0.5	<0.5	---	<0.5	---	--
	01/29/91	10	<0.5	<0.5	---	<0.5	---	--
	04/23/91	11	<0.5	<0.5	---	<0.5	---	--
	07/19/91	12	<0.5	<0.5	---	<0.5	---	--
	10/09/91	13	<0.5	<0.5	---	<0.5	---	<10
	03/26/92	14	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	04/21/92	15	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	07/28/92	16	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	10/21/92	17	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	01/27/93	18	<2	<1	<5,000	<0.5	<5	<10

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	cis-1,3-Dichloro-propene	trans-1,3-Dichloro-propene	Ethanol	Ethyl-benzene	2-Hexanone	Methyl Ethyl Ketone
SNARL[a]			NSL[b]	NSL	NSL	NSL	NSL	750
MW-6	10/31/89	5	<5	<5	---	<5	---	<50
	01/25/90	6	<0.5	<0.5	---	<0.5	---	ND
	04/17/90	7	<5.0	<5.0	---	<5.0	---	ND
	07/19/90	8	<0.5	<0.5	---	<0.5	---	--
	10/18/90	9	<0.5	<0.5	---	<0.5	---	--
	01/29/91	10	<0.5	<0.5	---	<0.5	---	--
	04/23/91	11	<0.5	<0.5	---	<0.5	---	--
	07/19/91	12	<0.5	<0.5	---	<0.5	---	--
	10/09/91	13	<0.5	<0.5	---	<0.5	---	<10
	01/30/92	14	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	04/21/92	15	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	07/29/92	16	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	10/30/92	17	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	01/27/93	18	<2	<1	<5,000	<0.5	<5	<10
MW-10	01/30/92	14	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	04/21/92	15	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	07/29/92	16	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	10/21/92	17	<2.0	<1.0	<5,000	<0.5	<5.0	<10.0
	01/27/93	18	<2	<1	<5,000	<0.5	<5	<10

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.
[d]Compound not detected.
[e]Not analyzed.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter (μg/l)

Monitoring Well	Date	Quarter	Methylene Chloride	Methyl, Isobutyl, Ketone	Styrene	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene
SNARL[a]			150	NSL	100	NSL[b]	20	340
MW-1	01/27/88	(1)[c]	<5	---	---	<5	<5	<5
	07/29/88	(1)	<5	---	---	<5	<5	<5
	08/15/88	(1)	<5	---	---	<5	<5	<5
	10/04/88	1	<5	---	---	<5	<5	<5
	01/25/89	2	<5	---	---	<5	<5	<5
	04/17/89	3	<5	---	---	<5	<5	<5
	07/27/89	4	<5	---	---	<5	<5	<5
	01/27/93	18	<0.5	<5	<1	<1	<0.5	<0.5
MW-3	02/17/88	(1)	<5	---	---	<5	<5	<5
	05/27/88	(1)	<5	---	---	<5	<5	<5
	07/29/88	(1)	<5	---	---	<5	<5	<5
	08/15/88	(1)	<5	---	---	<5	<5	<5
	10/04/88	1	<5	---	---	<5	<5	<5
	01/25/89	2	<5	---	---	<5	<5	<5
	04/17/89	3	<5	---	---	<5	<5	<5
	07/27/89	4	<5	---	---	<5	<5	<5
	01/27/93	18	<0.5	<5	<1	<1	<0.5	<0.5
MW-4	06/15/88	(1)	<5	---	---	<5	<5	<5
	07/29/88	(1)	<5	---	---	<5	<5	<5
	08/15/88	(1)	<5	---	---	<5	<5	<5
	10/04/88	1	<5	---	---	<5	<5	<5
	01/25/89	2	<5	---	---	<5	<5	<5
	04/17/89	3	<5	---	---	<5	<5	<5
	05/17/89	3	<300	---	---	<50	<50	<50
	07/27/89	4	<62.5	---	---	<62.5	<62.5	<62.5
	10/31/89	5	<5	---	---	<5	<5	<5
	01/25/90	6	<12.5	---	---	<12.5	<12.5	<12.5
	04/17/90	7	<5.0	---	---	<5.0	<5.0	<5.0
	07/17/90	8	<0.5	---	---	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	---	---	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	---	---	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	---	---	<0.5	<0.5	<0.5
	07/19/91	12	0.5	---	---	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	---	---	<0.5	<0.5	<0.5
	01/30/92	14	<5.0	<5.0	<1.0	<10	<5.0	<5.0
	04/21/92	15	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	Methylene Chloride	Methyl, Isobutyl, Ketone	Styrene	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene
SNARL[a]			150	NSL	100	NSL[b]	20	340
MW-5	10/31/89	5	<5	---	---	<5	<5	<5
	01/25/90	6	<0.5	---	---	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	---	---	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	---	---	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	---	---	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	---	---	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	---	---	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	---	---	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	---	---	<0.5	<0.5	<0.5
	03/26/92	14	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	04/21/92	15	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	07/28/92	16	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	10/21/92	17	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	01/27/93	18	<0.5	<5	<1	<1	<0.5	<0.5
MW-6	10/31/89	5	<5	---	---	<5	<5	<5
	01/25/90	6	<0.5	---	---	<0.5	<0.5	<0.5
	04/17/90	7	<5.0	---	---	<5.0	<5.0	<5.0
	07/19/90	8	<0.5	---	---	<0.5	<0.5	<0.5
	10/18/90	9	<0.5	---	---	<0.5	<0.5	<0.5
	01/29/91	10	<0.5	---	---	<0.5	<0.5	<0.5
	04/23/91	11	<0.5	---	---	<0.5	<0.5	<0.5
	07/19/91	12	<0.5	---	---	<0.5	<0.5	<0.5
	10/09/91	13	<0.5	---	---	<0.5	<0.5	<0.5
	01/30/92	14	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	04/21/92	15	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	07/29/92	16	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	10/30/92	17	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	01/27/93	18	<0.5	<5	<1	<1	<0.5	<0.5
MW-10	01/30/92	14	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	04/21/92	15	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	07/29/92	16	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	10/21/92	17	<0.5	<5.0	<1.0	<1.0	<0.5	<0.5
	01/27/93	18	<0.5	<5	<1	<1	<0.5	<0.5

[a]Suggested No-Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation of quarterly sampling programs.

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter (μg/l)

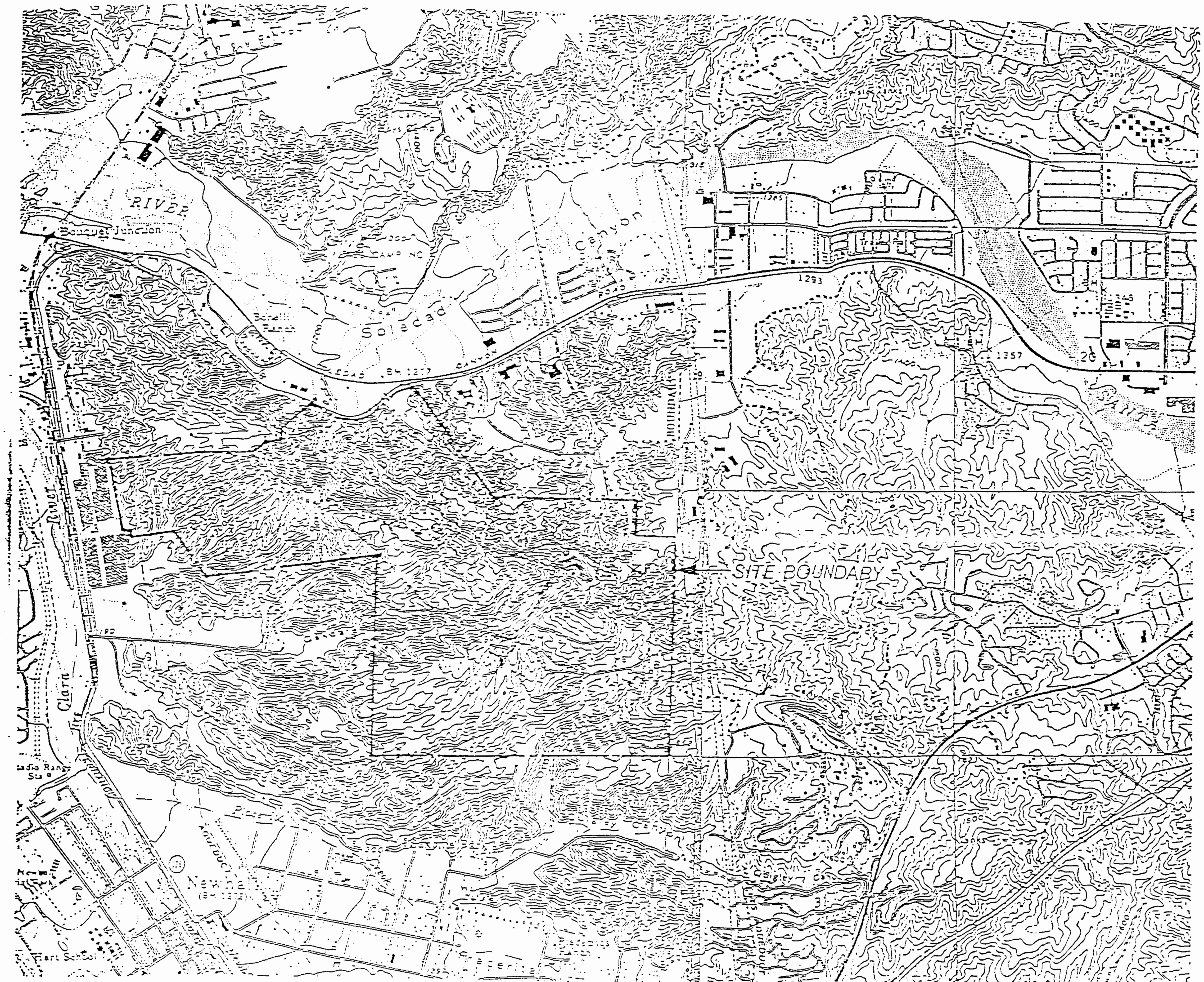
Monitoring Well	Date	Quarter	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	Vinyl Acetate	Vinyl Chloride	Xylenes
SNARL[a]			200	NSL[b]	75	NSL	NSL	2	420
MW-1	01/27/88	(1)[c]	<5	<5	<5	<5	---	<10	<5
	07/29/88	(1)	<5	<5	<5	<5	---	<10	<5
	08/15/88	(1)	<5	<5	<5	<5	---	<10	<5
	10/04/88	1	<5	<5	<5	<5	---	<10	<5
	01/25/89	2	<5	<5	<5	<5	---	<10	<5
	04/17/89	3	<5	<5	<5	<5	---	<10	<5
	07/27/89	4	<5	<5	<5	<5	---	<5	<5
	01/27/93	18	<0.5	<0.5	<1	<1.5	<100	<0.5	<1
MW-3	02/17/88	(1)	<5	<5	<5	<5	---	<10	<5
	05/27/88	(1)	<5	<5	<5	<5	---	<10	<5
	07/29/88	(1)	<5	<5	<5	<5	---	<10	<5
	08/15/88	(1)	<5	<5	<5	<5	---	<10	<5
	10/04/88	1	<5	<5	<5	<5	---	<10	<5
	01/25/89	2	<5	<5	<5	<5	---	<10	<5
	04/17/89	3	<5	<5	<5	<5	---	<5	<5
	07/27/89	4	<5.0	<5.0	<5.0	<5.0	---	<5.0	<5.0
	01/27/93	18	<0.5	<0.5	<1	<1.5	<100	<0.5	<1
MW-4	06/15/88	(1)	<5	<5	<5	<5	---	<10	<5
	07/29/88	(1)	<5	<5	<5	<5	---	<10	<5
	08/15/88	(1)		<5	<5	<5	---	<10	<5
	10/04/88	1	<5	<5	<5	<5	---	<10	<5
	01/25/89	2	<5	<5	<5	<5	---	<10	<5
	04/17/89	3	<5	<5	4,800	<5	---	<10	<5
	05/17/89	3	<50	<50	7,200	<50	---	<300	<50
	07/27/89	4	<62.5	<62.5	1,390	<62.5	---	<62.5	<62.5
	10/31/89	5	<5	<5	195	<5	---	<5	<5
	01/25/90	6	<12.5	<12.5	126	<12.5	---	<12.5	<12.5
	04/17/90	7	<5.0	<5.0	7.8	<5.0	---	<5.0	<5.0
	07/17/90	8	<0.5	<0.5	3.0	<0.5	---	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	1.0	<0.5	---	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	1.8	<0.5	---	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	1.0	<0.5	---	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	6.4	<0.5	---	<0.5	<0.5
	01/30/92	14	<5.0	<5.0	83	<15	<10	<10.0	<10
	4/21/92	15	<0.5	<0.5	<1.0	<1.5	<10	<0.5	<1.0

TABLE 5 - continued

AREA 317 VOLATILE ORGANIC COMPOUNDS IN GROUND WATER MONITORING WELLS
Concentrations in Micrograms per Liter ($\mu g/l$)

Monitoring Well	Date	Quarter	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoro-methane	Vinyl Acetate	Vinyl Chloride	Xylenes
SNARL[a]			200	NSL[b]	75	NSL	NSL	2	420
MW-5	10/31/89	5	<5	<5	<5	<5	---	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	---	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	03/26/92	14	<0.5	<0.5	<1.0	<1.5	<10	<1	<1.0
	04/21/92	15	<0.5	<0.5	<1.0	<1.5	<10	<0.5	<1.0
	07/28/92	16	<0.5	<0.5	<1.0	<1.5	<100.0	<0.5	<1.0
	10/21/92	17	<0.5	<0.5	<1.0	<1.5	<100.0	<0.5	<1.0
	01/27/93	18	<0.5	<0.5	<1	<1.5	<100	<0.5	<1
MW-6	10/31/89	5	<5	<5	<5	<5	---	<5	<5
	01/25/90	6	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	04/17/90	7	<5.0	<5.0	<5.0	<5.0	---	<5.0	<5.0
	07/19/90	8	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	10/18/90	9	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	01/29/91	10	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	04/23/91	11	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	07/19/91	12	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	10/09/91	13	<0.5	<0.5	<0.5	<0.5	---	<0.5	<0.5
	01/30/92	14	<0.5	<0.5	<1.0	<1.5	<10.0	<1.0	<1.0
	04/21/92	15	<0.5	<0.5	<1.0	<1.5	<10.0	<1.0	<1.0
	07/29/92	16	<0.5	<0.5	<1.0	<1.5	<100.0	<1.0	<1.0
	10/30/92	17	<0.5	<0.5	<1.0	<1.5	<100.0	<1.0	<1.0
	01/27/93	18	<0.5	<0.5	<1	<1.5	<100	<0.5	<1
MW-10	01/30/92	14	<0.5	<0.5	<1.0	<1.5	<10.0	<1.0	<1.0
	04/21/92	15	<0.5	<0.5	<1.0	<1.5	<10.0	<0.5	<1.0
	07/29/92	16	<0.5	<0.5	<1.0	<1.5	<100.0	<0.5	<1.0
	10/21/92	17	<0.5	<0.5	<1.0	<1.5	<100.0	<0.5	<1.0
	01/27/93	18	<0.5	<0.5	<1	<1.5	<100	<0.5	<1

[a]Suggested No Adverse Response Level.
[b]No suggested level.
[c]Samples collected prior to implementation quarterly sampling programs.



GENERAL NOTES:
BASE MAPS FROM U.S.G.S
MINT CANYON & NEWHALL
7.5 MINUTE TOPOGRAPHIC
PHOTOREVISED 1988

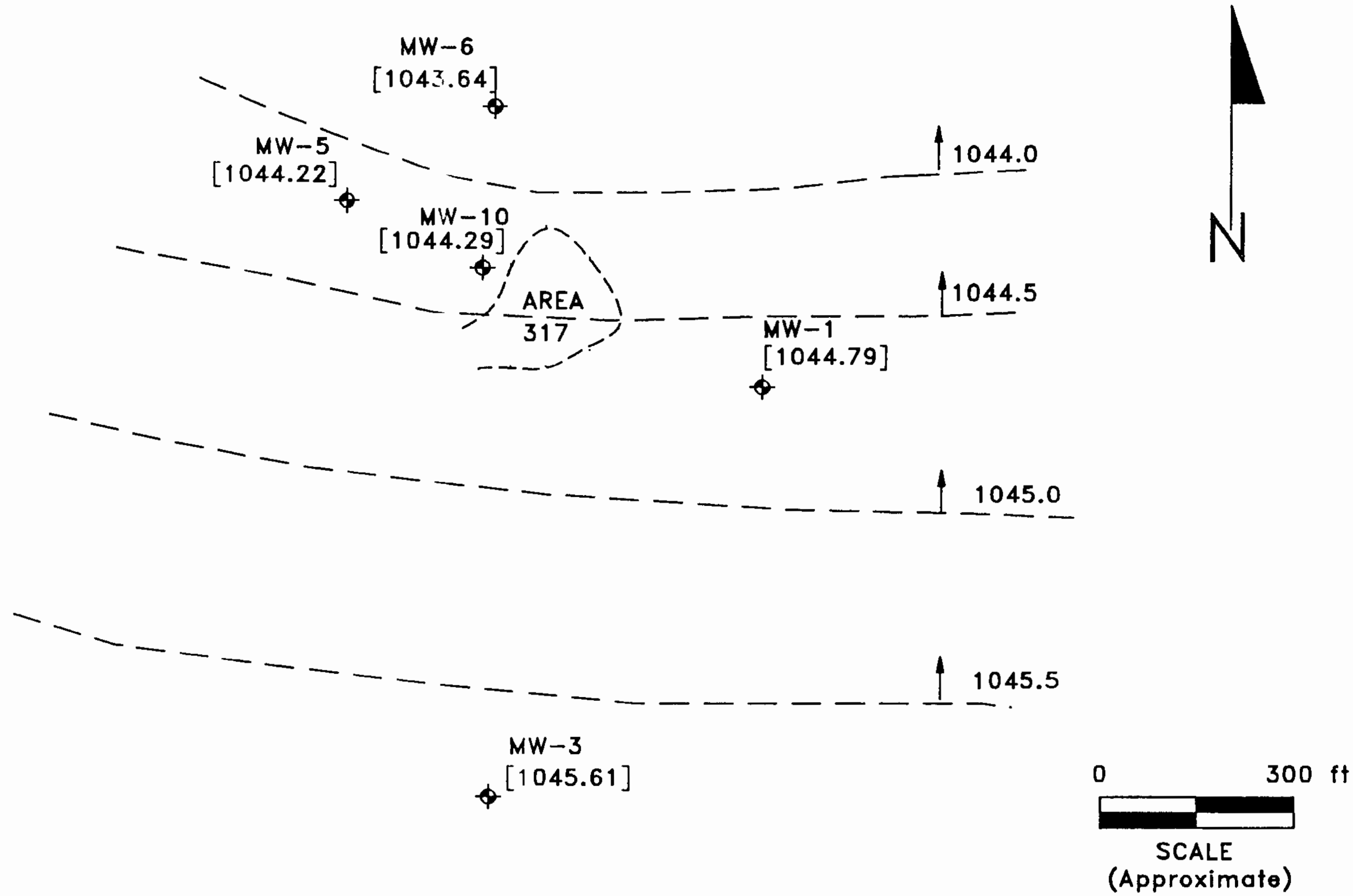
---- APPROXIMATE SITE LOCATION BOUND

QUADRANGLE LOCATION

0 2000 FT

SCALE 1 : 24,000

FIGURE 1		
SITE LOCATION		
WHITTAKER CORPORATION, BERMITE DIVISIO 22116 WEST SOLEDAD CANYON ROAD SANTA CLARITA, CALIFORNIA		
Project No. WHI01	Drawn By HDA	Acton * Mickelson * van Dam Consulting Scientists, Engine and Geologists 5090 Robert J. Mathews Parkw El Dorado Hills, California 95 (916) 939-7550
File No. ——	Prepared By MAA	
Revision No.	Reviewed By MAA	



LEGEND

MW-1 Monitoring Well Location

[1043.64] Ground Water Elevation in Feet Relative to Mean Sea Level

1044.0 Inferred Ground Water Contour in Feet Relative to Mean Sea Level

Inferred Ground Water Flow Direction

FIGURE 2

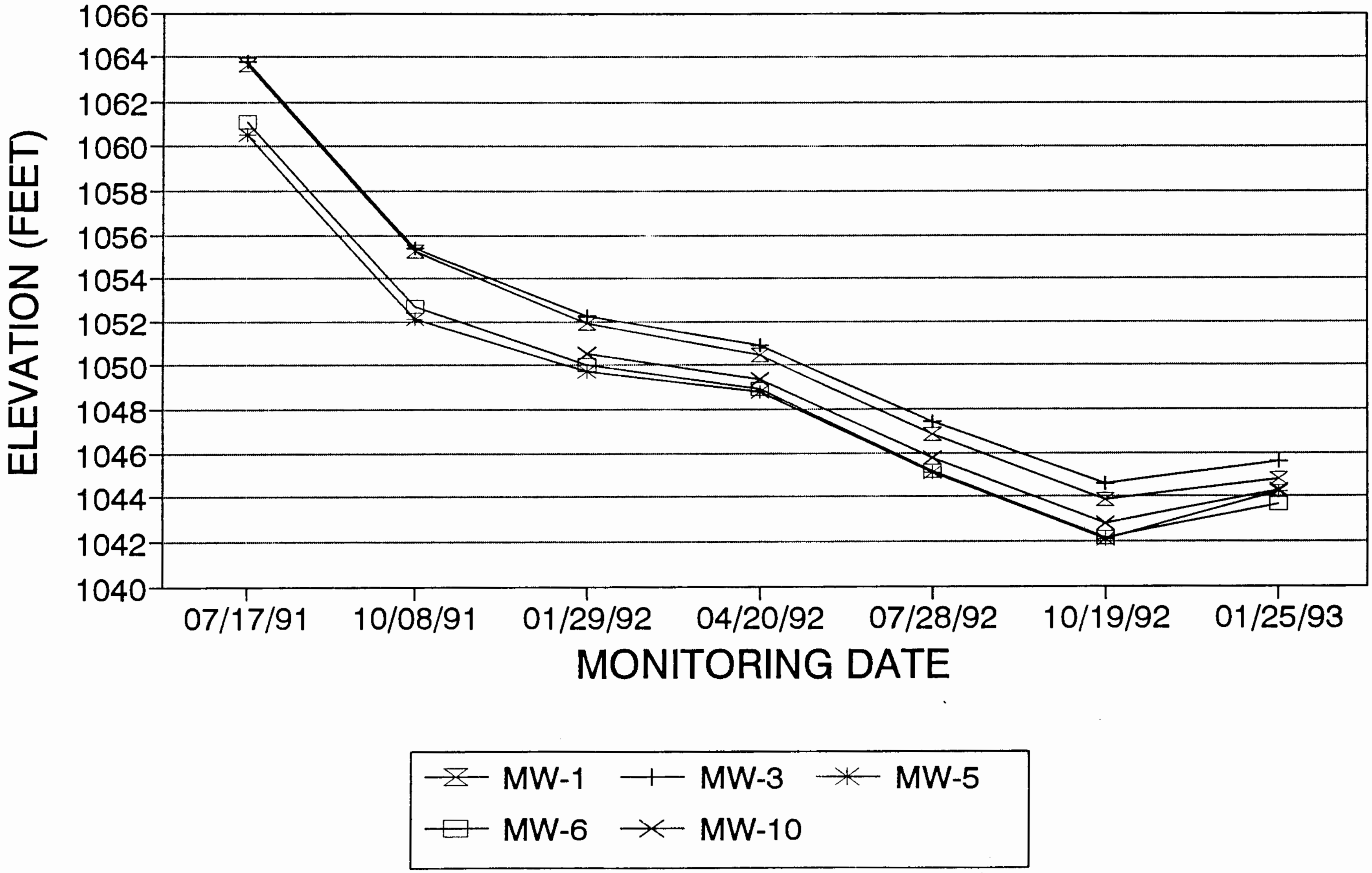
AREA 317 GROUND WATER MONITORING WELL LOCATIONS AND INFERRED GROUND WATER FLOW DIRECTION (01-25-93)
WHITTAKER CORPORATION, BERMITE DIVISION
22116 W Soledad Canyon Rd, Santa Clarita, CA

Project No.	Drawn	
WHI01.38	EAF	Acton • Mickelson • van Dam, Inc. Consulting Scientists, Engineers, and Geologists
File No. W013802	Prepared MAA	5090 Robert J. Mathews Parkway, #4 El Dorado Hills, California 95762 (916) 939-7550
Revision	Reviewed	

FIGURE 3

RCRA GROUND WATER MONITORING WELLS

POTENTIOMETRIC SURFACE ELEVATIONS



APPENDIX A

DOCUMENT SUBMITTAL CHRONOLOGY

APPENDIX A

DOCUMENT SUBMITTAL CHRONOLOGY

The following documents have been submitted to CAL-EPA and U.S. EPA, Region IX, in fulfillment of the Closure Plan regarding ground water monitoring at Areas 317 and 342:

- Whittaker Corporation, Bermite Division, Santa Clarita, CA CAD064573108, Facility Closure Plan Modifications, April 1987.
- Revised Ground Water Monitoring Plan for the 317/342 Area, October 8, 1987.
- Proposed Interim Status Ground Water Monitoring Sampling and Analysis Program, December 1987.
- Documentation Report--Construction and Development of Wells for Ground Water Monitoring of the 342 and 317 Areas, February 1988.
- Verification Sampling Results at Selected RCRA Units, March 1988.
- RCRA Ground Water Monitoring System--Proposed Final Configuration, May 1988.
- Ground Water Sampling and Analysis Plan, August 1988.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 1, December 1988.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 2, March 1989.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 3, July 1989.
- Specific Plan for a Ground Water Quality Assessment Program, June 1989.
- Interim Response Action Plan, 317 Area Soil and Ground Water Remediation, June 1989.
- Site Ground Water Sampling and Analysis Plan, Appendix IV of 40 CFR 264.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 4, September 1989.
- Statistical Analysis--Well MW-2 Versus MW-1 and MW-3, October 1989.

- RCRA Ground Water Sampling, Quarterly Sampling Report No. 5, March 1990.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 6, May 1990.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 7, June 1990.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 8, October 1990.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 9, January 1991.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 10, April 1991.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 11, July 1991.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 12, October 1991.
- Specific Plan for a Ground Water Quality Assessment Program for the 317 Surface Impoundment Area.
- RCRA Ground Water Sampling, Quarterly Sampling Report No. 13, January 1992.
- Area 317 RCRA Quarterly Ground Water Quality Monitoring Report No. 14 and Report of Monitoring Well MW-10 Installation, January through March 1992.
- Area 317 RCRA Quarterly Ground Water Quality Monitoring Report No. 15, April through June 1992.
- Area 317 RCRA Quarterly Ground Water Quality Monitoring Report No. 16, July through September 1992.
- Water Quality Monitoring and Response Plan for the Interim Status Area 317 Surface Impoundment, October 1992.
- Area 317 RCRA Quarterly Ground Water Quality Monitoring Report No. 17, October through December 1992.

APPENDIX B

GROUND WATER SAMPLING PROCEDURES

APPENDIX B

GROUND WATER SAMPLING PROCEDURES

On January 25, 1993, initial depth to water measurements were collected prior to the onset of monitoring well evacuation activities. Operation of the pumps in monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10 was then initiated to evacuate stagnant water. Pumping durations to evacuate these five monitoring wells are summarized in Table B-1. Prior to sample collection, the pumping rate for each monitoring well was reduced to approximately 100 milliliters per minute (ml/min) in a 1/4-inch-diameter tube.

In accordance with the "Ground Water Sampling and Analysis Plan," dated August 1988, evacuated ground water from monitoring wells MW-1, MW-3, MW-5, MW-6, and MW-10 was discharged to the ground surface, downgradient from each monitoring well.

Well Stabilization

Well stabilization measurements were periodically collected after well evacuation activities were initiated. Stabilization measurements for pH, temperature, and specific conductance were taken three times prior to sampling of each well to increase the likelihood that representative ground water samples were collected. Table B-2 summarizes the results of the stabilization tests. As shown in Table B-2, the reported measurements in each monitoring well indicated a relatively stable condition prior to sampling.

Sample Containers

Sample containers used for the collection of ground water samples were supplied by Eagle Picher Environmental Services and I-Chem, Inc. The sample containers used were precleaned and sealed at these facilities and are statistically certified as clean and free of volatile organic and metal compounds. Certificates of Analysis for the sample containers used during the quarterly ground water sampling event are provided in this appendix.

Sample Labeling

Sample identification labels were filled out in the field at the time of sample collection in accordance with the "Ground Water Sampling and Analysis Plan," dated August 1988. A sample identification system was established to clearly and properly label samples. Each label identifies the monitoring well number, analytical parameter required, quarterly sampling event number, and replicate number (if required). A legend is provided in Table B-4 outlining the labeling system.

Sample Collection

Sampling Volumetric Flow Rate

A Teflon sampling valve and stem were installed into the invert of the well discharge pipe of each monitoring well to minimize aeration and agitation of the collected ground water sample. The flow rates in the monitoring wells were reduced to approximately 100 milliliters/minute (ml/min) in a 1/4-inch-diameter tube prior to sampling.

Order of Sample Collection

The ground water at each monitoring well was sampled for selected analytical parameters in the same order. This order is presented in Table B-5.

Field Sample Preservation

Ground water samples collected for dissolved metals were collected and filtered through an in-line, 0.45 micron filter, manufactured by Instrumentation Northwest, Inc. These filters are specially designed for ground water sampling for dissolved metals and are not reused between samples or monitoring wells. A 50 percent nitric acid solution was added to the sample containers after filtration of the ground water sample to lower the pH. The pH of the water sample was monitored with an electric pH meter as the acid was added with a small pipette. Acid was added until a pH of less than 2 was achieved. Samples collected for analysis of TOC and TOX were also preserved. Sulfuric acid was added to the samples using the same procedures discussed above adjusting the pH to less than 2.

Following collection, labeling, and sealing, each individual ground water sample was placed in a refrigerator and locked. Samples were placed on ice in a cooler following collection and delivered to the laboratory on January 27, 1993.

Field and Trip Sample Blanks

During each quarterly sampling event, field and trip blanks were analyzed for VOCs, TOCs, and TOXs in accordance with the "Ground Water Sampling and Analysis Plan," dated August 1988.

The trip blanks were prepared in the laboratory, transferred to the site in coolers, stored in the refrigerator overnight, transferred to each sampling location during sampling activities, and stored with collected ground water samples throughout the sampling event and delivered to the laboratory.

The field blanks are prepared in the field using water provided by the analytical laboratory. These field blanks, once prepared, were stored with the ground water samples throughout the sampling event and delivered to the laboratory.

FIELD QA/QC

Washing of Field Test Equipment

To minimize the potential for cross-contamination between well samples, field equipment used during sampling activities was decontaminated between each well. Decontamination procedures involved cleaning and rinsing with deionized water before and after each sample was collected at each well. The mercury thermometer, pH probe, nitric and sulfuric acid eye droppers, specific conductance probe, and the water level meter probe were all decontaminated between samples.

Unused sampling gloves were worn by sampling personnel prior to sealing the sample containers with the chain-of-custody seals.

Sample Container Labeling and Seals

As previously stated, the sample containers were labeled in the field as each sample was collected. A unique sample identification number was assigned to each ground water sample. Chain-of-custody seals were then placed on the sample containers after sampling and labeling. The ground water samples were placed on ice in a cooler, and the cooler was sealed with chain-of-custody seals prior to shipment to the laboratory.

Chain-of-Custody and Sample Analysis Request Forms

Chain-of-custody forms were filled out at the time of sample collection and were kept with the samples until they were delivered to the laboratory. Copies of the signed chain-of-custody forms are provided in Appendix C.

Sample analysis request forms were also filled out at the time of sample collection and were kept with the samples until they were delivered to the laboratory. Sample analysis request forms are used to inform the laboratory of the analysis to run on each ground water sample. Copies of the sample analysis request forms are provided in Appendix D.

Delivery of Samples to Laboratory

Ground water samples were delivered to FGL in Santa Paula, California, by personnel of Whittaker after sampling activities were completed. FGL is approximately 45 minutes by car from the site. Maximum and minimum thermometers were placed in each cooler for temperature verification. Upon arrival at the laboratory, the temperature was recorded on the sample analysis request form. The temperature of the samples was kept below 4° C.

Security

Security measures were implemented to minimize the likelihood that unauthorized personnel had access to the wells or ground water samples before, during, or after sampling activities. The site is fenced-in with locking gates and has 24-hour security personnel present. Each monitoring well has a locking cap to deter unauthorized access to the well. The ground water samples were handled by Whittaker personnel only during sampling activities and delivery to FGL.

TABLE B-1

AREA 317 WELL EVACUATION
BERMITE DIVISION, WHITTAKER CORPORATION

Well Number	Date Pump Started	Evacuation	Sampling[a]	Time and Date of Sample Collection
		Approximate Duration of Pumping (hours)	Duration of Pumping (minutes)	
MW-1	01/26/93	24	0.75	0845 (01/27/93)
MW-3	01/26/93	24	0.25	0815 (01/27/93)
MW-5	01/26/93	24	1.67	0940 (01/27/93)
MW-6	01/26/93	24	2.17	1010 (01/27/93)
MW-10	01/26/93	24	1.17	0910 (01/27/93)

[a]Flow rate from wells was reduced prior to sampling. Actual sample extraction flow rate for all wells approximately 100 milliliter/minute in a 1/4-inch pipe.

TABLE B-2

WELL STABILIZATION TESTS
BERMITE DIVISION, WHITTAKER CORPORATION

Well	Temperature (° C.)	pH	Specific Conductance (μmhos)[a]	Time and Date
MW-1	22.8	7.40	649	1210 - 01/26/93
	22.9	7.15	704	1510 - 01/26/93
	22.2	7.43	710	0715 - 01/27/93
MW-3	24.4	6.79	636	1200 - 01/26/93
	24.1	7.08	639	1500 - 01/26/93
	23.6	7.32	645	0705 - 01/27/93
MW-5	23.3	7.73	534	1220 - 01/26/93
	23.3	6.88	539	1520 - 01/26/93
	22.6	7.64	532	0720 - 01/27/93
MW-6	23.4	7.74	550	1225 - 01/26/93
	23.3	7.40	547	1525 - 01/26/93
	22.7	7.66	544	0725 - 01/27/93
MW-10	23.0	7.60	640	1215 - 01/26/93
	23.5	6.99	634	1515 - 01/26/93
	22.6	7.67	634	0730 - 01/27/93

[a]μmhos - micromhos.

TABLE B-3

LABORATORY ANALYTICAL METHODS AND SAMPLE VOLUME AND CONTAINER REQUIREMENTS
AREA 317 GROUND WATER MONITORING WELLS
WHITTAKER CORPORATION, BERMITE DIVISION

Constituent	Analytical Method	Sample Volume (milliliters)	Container Type
Indicator Parameters			
pH	EPA 150.1	50	Plastic/glass
Specific Conductance	EPA 120.1	100	Plastic
Total Organic Carbon	EPA 9060	250	Amber glass-TFE cap
Total Organic Halogen	EPA 9020	250	Amber glass-TFE cap
Ground Water Quality Parameters			
Sulfate	EPA 375.4	200	Plastic/glass
Sodium	EPA 6010	200	Plastic
Iron	EPA 6010	200	Plastic
Manganese	EPA 6010	200	Plastic
Phosphorus	EPA 365.4	100	Plastic/glass
Fluoride	EPA 340.2	100	Plastic/glass
Chloride	SM 407C	100	Plastic/glass
Arsenic	EPA 7060	100	Plastic
Barium	EPA 6010	100	Plastic
Cadmium	EPA 7131	100	Plastic
Chromium	EPA 7191	100	Plastic
Lead	EPA 7421	100	Plastic
Mercury	EPA 7470	200	Plastic/glass
Selenium	EPA 7741	100	Plastic
Silver	EPA 7761	100	Plastic
Hazardous Constituent Parameters			
Volatile Organic Compounds	EPA 624	3 x 40	Amber glass-TFE cap
Antimony	EPA 7041	100	Plastic
Copper	EPA 6010	100	Plastic
Thallium	EPA 7841	100	Plastic

TABLE B-4

AREA 317
KEY TO ANALYSIS DESIGNATION LABELS ON SAMPLE CONTAINERS
BERMITE DIVISION, WHITTAKER CORPORATION

Analysis Designation	Parameter(s) to be Analyzed
A	pH Specific Conductance (temperature corrected)
B	Total Organic Carbon (TOC)
C	Total Organic Halogen (TOX)
H	Sulfate, Chloride, Sodium, Iron, Manganese
I	Total Phosphate
K	Dissolved Metals: Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Selenium, Thallium
N	Fluoride
O	Volatile Organics

Each sample container was labeled with a unique sample number. The form of each label was as follows:

Well I.D./Analysis Designation/Sample Event No./Replicate No.

Where:

Well I.D. = MW-1, MW-3, MW-4, MW-5, MW-6, or MW-10.
Analysis Designation = A through O according to above table.
Sample Event No. = 1 through present event number.
Replicate No. = 1 through 4.

Note: Absence of replicate number indicates that replicate samples were not required.

TABLE B-5

ORDER OF SAMPLE COLLECTION
BERMITE DIVISION, WHITTAKER CORPORATION

1	Volatile Organics
2	Total Organic Carbon (TOC)
3	Total Organic Halogen (TOX)
4	pH, Specific Conductance
5	Dissolved Metals
6	Dissolved Silver
7	Sulfate, Chloride, Sodium, Iron, Manganese
8	Fluoride
9	Total Phosphate

APPENDIX C

CHAIN-OF-CUSTODY FORMS

NO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR

GLEN ABDUN-NUR

PROJ. NO.	PROJECT NAME
85-01.4	BERMITE 317 AREA 18TH. QTRLY. WATER SAMPLING

SAMPLERS *(Signature)*

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH H_2SO_4 < 2	PH ADJUSTED WITH HNO_3 < 2	~~Radionu~~ PH ADJUSTED				REMARKS
MW1/A/18 1-4	1/27/93	0845		X	MONITORING WELL 1	4							ANALYSIS TYPE A
MW1/B/18 1-4	"	0849		X	"	4	X						" B
MW1/C/18 1-4	"	0853		X	"	4	X						" C
MW1/D/18	"	0854		X	"	2							" D
MW1/E/18	"	0855		X	"	2		X					" E
MW1/F/18	"	0856		X	"	1							" F
MW1/G/P/18	"	0857		X	"	1							" G,P
MW1/H/18	"	0858		X	"	1							" H
MW1/I/18	"	0859		X	"	1							" I
MW1/K,M/18	"	0900		X	"	1		X					" K,M
MW1/N/18	"	0901		X	"	1							" N
MW1/O/18	"	0902		X	"	3							" O

Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
	1/27/93	12:45 PM					
Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*

Relinquished by: *(Signature)*	Date	Time	Received for Laboratory by: *(Signature)*	Date	Time	Remarks
				1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

NJO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR: GLEN ABDUN-NUR

PROJ. NO.: 85-01.4

PROJECT NAME: BERMITE 18TH QUARTERL WATER SAMP. 317 AREA

SAMPLERS (Signature)

STA NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH H_2SO_4 <2	PH ADJUSTED WITH HNO_3 <2					REMARKS
MW3/A/18 1-4	1/27/93	0815		X	MONITORING WELL 3	4							ANALYSIS TYPE A
MW3/B/18 1-4	"	0819		X	"	4	X						" B
MW3/C/18 1-4	"	0823		X	"	4	X						" C
MW3/D/18	"	0827		X	"	2							" D
MW3/E/18	"	0828		X	"	2		X					" E
MW3/F/18	"	0829		X	"	1							" F
MW3/G,P/18	"	0830		X	"	1							" G,P
MW3/H/18	"	0831		X	"	1							" H
MW3/I/18	"	0832		X	"	1							" I
MW3/K,M/18	"	0833		X	"	1		X					" K,M
MW3/N/18	"	0835		X	"	1							" N
MW3/O/18	"	0836		X	"	3							" O

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	1/27/93	12:45					
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Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
				1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

ATO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR: GLEN ABOUN-NUR

PROJ. NO.: 85-01.4

PROJECT NAME: BERMITE 18TH. QTRLY. 317 AREA WATER SAMPLING

SAMPLERS (Signature):

STA NO	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH H_2SO_4 <2	PH ADJUSTED WITH HNO_3 <2					REMARKS
MW5/A/18 1-4	1/27/93	0940		X	MONITORING WELL 5	4							ANALYSIS TYPE A
MW5/B/18 1-4	"	0944		X	"	4	X						" B
MW5/C/18 1-4	"	0948		X	"	4	X						" C
MW5/D/18	"	0949		X	"	2							" D
MW5/E/18	"	0950		X	"	2		X					" E
MW5/F/18	"	0951		X	"	1							" F
MW5/G,P 18	"	0952		X	"	1							" G,P
MW5/H/18	"	0953		X	"	1							" H
MW5/I/18	"	0954		X	"	1							" I
MW5/K,M 18	"	0955		X	"	1		X					" K,M
MW5/N/18	"	0956		X	"	1							" N
MW5/O/18	"	0957		X	"	3							" O

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	1/27/93	1245					

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Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
				1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

NTO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR: Glen Abdun-Nur

PROJ. NO.: 85-01.4

PROJECT NAME: Bermite 18th Qtrly Water Sampling 317 Area

SAMPLERS (Signature): [signature]

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH H_2SO_4 <2	PH ADJUSTED WITH HNO_3 <2					REMARKS
MW6/A/18 1-4	1/27/93	1010		X	Monitoring Well 6	4							Analysis Type A
MW6/B/18 1-4	"	1014		X	"	4	X						" B
MW6/C/18 1-4	"	1018		X	"	4	X						" C
MW6/D/18	"	1022		X	"	2							" D
MW6/E/18	"	1023		X	"	2		X					" E
MW6/F/18	"	1024		X	"	1							" F
MW6/G,P/18	"	1025		X	"	1							" G, P
MW6/H/18	"	1026		X	"	1							" H
MW6/I/18	"	1027		X	"	1							" I
MW6/K,M/18	"	1028		X	"	1		X					" K, M
MW6/N/18	"	1029		X	"	1							" N
MW6/O/18	"	1030		X	"	3							" O

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	1/27/93	12:45	[signature]	[signature]			

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
			[signature]	1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

NTO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR: GLEN ABDUN-NUR

PROJ. NO.: 85-01.4

PROJECT NAME: BERMITE 317 AREA 18TH. QTRLY. WATER SAMPLING

SAMPLERS (Signature): [signature]

STA NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH H_2SO_4 L 2	PH ADJUSTED WITH HNO_3 L 2					REMARKS	
MW10/A/18 1-4	1/27/93	0910		X	MONITORING WELL 10	4							ANALYSIS TYPE	A
MW10/B/18 1-4	11	0914		X	11	4	X						11	B
MW10/C/18 1-4	11	0918		X	11	4	X						11	C
MW10/D/18	11	0922		X	11	2							11	D
MW10/E/18	11	0923		X	11	2		X					11	E
MW10/F/18	11	0924		X	11	1							11	F
MW10/G,P 18	11	0925		X	11	1							11	G,P
MW10/H/18	11	0926		X	11	1							11	H
MW10/I/18	11	0927		X	11	1							11	I
MW10/K,M 18	11	0928		X	11	1		X					11	K,M
MW10/N/18	11	0929		X	11	1							11	N
MW10/O/18	11	0930		X	11	3							11	O

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	1/27/93	1245	[signature]	[signature]			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)

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			[signature]	1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

BT(I)

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR

GLEN ABDUN-NUR

PROJ. NO.	PROJECT NAME
85-014	BERMITE 18TH WATER QTRLY SAMPLING EVENT

SAMPLERS (Signature)

STA NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	PH ADJUSTED WITH $H_2SO_4 < 2$						REMARKS
MW5(B)18 1A	1/27/93	1000		X	MONITORING WELL 5	1	X						ANALYSIS TYPE B
MW5(C)18 1A	"	1001		X	"	1	X						" C
MW5(D)18 1A	"	1002		X	"	3							" D
MW6(B)18 1A	"	1032		X	MONITORING WELL 6	1	X						" B
MW6(C)18 1A	"	1033		X	"	1	X						" C
MW6(D)18 1A	"	1034		X	"	3							" D

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	1/27/93	1245					
Relinquished by: (Signature)	**Date**	**Time**	**Received by: (Signature)**	**Relinquished by: (Signature)**	**Date**	**Time**	**Received by: (Signature)**

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
				1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

NO

CHAIN OF CUSTODY RECORD

FIELD COORDINATOR: GLEN ABDUN-NUR

PROJ. NO. 85-014

PROJECT NAME: 18TH. & 7TH. BERMITE QTRLY SAMPLING EVENT

SAMPLERS (Signature)

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NUMBER OF CONTAINERS							REMARKS
MW1Q/18	1/27/93	0903		X	MONITORING WELL 1	1							ANALYSIS TYPE Q
MW2Q/7	11	1231		X	11 2	1							11 11
MW3Q/18	11	0837		X	11 3	1							11 11
MW5Q/18	11	0958		X	11 5	1							11 11
MW6Q/18	11	1031		X	11 6	1							11 11
MW7Q/7	11	1106		X	11 7	1							11 11
MW8Q/7	11	1136		X	11 8	1							11 11
MW9Q/7	11	1203		X	11 9	1							11 11
MW10Q/18	11	0931		X	11 10	1							11 11

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	1/27/93	1245					
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
				1/27/93	1:45p	

DISTRIBUTION: Original Accompanies Shipment; Copy to Coordinator Field Files

9301262

FRUIT GROWERS LABORATORY, INC.

CHAIN-OF-CUSTODY

Date: 1/28/93
Client: FGL
Address:
Phone: ( )- -
Fax: ( )- -

Project name:
Contact person: GINA KOLAKOWSKI
Sampler(s):
Comp sampler setup: Date: / / Time: :
Time: Mileage:
Purchase order number:
QA/QC report required: Yes ___ No ___
Lab number:

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sample: Composite(C) Grab (G)	Number of Containers	Type of Containers: (B)Brass (V) VOA (G) Glass (P) Plastic	(S) Soil (SL)Sludge (O) Oil	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (WW) Wastewater (S) Spike (DW) Drinking Water	(P) Potable (NP) None Potable	Preservative: NaHSO4, HCL, H2SO4, HNO3, pH <2 NaOH pH > 9 or pH > 12 ; Na2S2O3 if chlorinated Other	Formaldehyde								Sample Condition: Temperature ___ (L) Leaking, (B) Broken (HS) VOA Headspace	Custody Seal (Y) (N)
1	SP 300437-1	1/27/93	0903	G	1	G		MW		—	X									✓
2	-2		1231																	✓
3	-3		0837																	✓
4	-4		0958																	✓
5	-5		1031																	✓
6	-6		1106																	✓
7	-7		1136																	✓
8	-8		1203																	✓

Misc. notes:

Rush results due by:
Final sample disposition:

Lab disposal: ________ Return to Client: ________
Meth. of disp.: ________ Date of ret.: / /

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Gina Kolakowski	1/29/93	3:00	Terry Salio	1/29/93	10:30 AM

9301262

FRUIT GROWERS LABORATORY, INC.

CHAIN-OF-CUSTODY

Date: 1/28/93
Client: FGL
Address: ____________________
____
Phone: (____)-____-______
Fax: (____)-____-______

Project name: ____________________
Contact person: ____________________
Sampler(s): ____________________
Comp sampler setup:Date:___/___/___ Time:___:___
Time:__________ Mileage:__________
Purchase order number: ____________________
QA/QC report required: Yes_____ No_____
Lab number: ____________________

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sample: Composite(C) Grab (G)	Number of Containers	Type of Containers: (B)Brass (V) VOA (G) Glass (P) Plastic	(S) Soil (SL)Sludge (O) Oil	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (WW) Wastewater (S) Spike (DW) Drinking Water	(P) Potable (NP) None Potable	Preservative:NaHSO4, HCL, H2SO4, HNO3, pH <2 NaOH pH > 9 or pH > 12 ; Na2S2O3 if chlorinated Other	Formaldehyde									Sample Condition: Temperature ____ (L) Leaking, (B) Broken (HS) VOA Headspace	Custody Seal (Y) (N)
9	SP 300437-9	1/27/93	0931	G	1	G		MW			X										✓
																					✓
																					/
																					/
																					/
																					/
																					/

Misc. notes:

Rush results due by:
Final sample disposition:

Lab disposal:__________ Return to Client:__________

Meth. of disp.:__________ Date of ret.:___/___/___

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
G. Koladowski	1/28/93	3:00P	Terry Salvo	1/29/93	10:30A

FGL ENVIRONMENTAL

9301262

ANALYTICAL CHEMISTS

LABORATORY TESTING SUBMISSION FORM

Client: FGL Our Lab No.: SP 300437

Person submitting sample: Gina Kolokowski

Laboratory sample is being submitted to: CLAYTON

Date Mailed: 1/28/93 Shipped Via: UPS NEXT DAY AIR

Number of samples being submitted: 9 Solid: ____ Liquid: ✓

RUSH YES____ NO ✓ If yes, date needed by: ____________

Type of analyses to be performed:

FORMALDEHYDE

*** LABORATORY - Attached is a confirmation of receipt, please answer questions and PLEASE RETURN TO US AS SOON AS POSSIBLE ***

APPENDIX D

SAMPLE ANALYSES REQUEST FORMS

SAMPLE ANALYSIS REQUEST

Sampling Information

Project No. 85-01.4 Project Name: 317 AREA BERMITE 18TH. QTRLY. SAMPLING

Sampler Name: GLEN ABDUNNUR/TIM BRICKER Tele. No.(805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	PHENOLS SEMI VOC'S	SULPHATE CHLORIDE	TOTAL ~~[illegible]~~ PHOSPHATES	DISS METALS W/SILVER	FLOORIDE	EPA 624 VOC'S
MW1/G,P/18	300423	X					
MW1/H/18	↓		X				
MW1/I/18	↓			X			
MW1/K,M/18	↓				X		
MW1/N/18	↓					X	
MW1/O/18	↓						X
MW3/GP/18	300440	X					
MW3/H/18	↓		X				
MW3/I/18	↓			X			
MW3/K,M/18	↓				X		
MW3/N/18	↓					X	
MW3/O/18	↓						X

SAMPLE ANALYSIS REQUEST

Sampling Information

Project No. 85-01.4 Project Name: BERMITE 18TH. QTRLY. SAMPLING 317 AREA

Sampler Name: GLEN ABDUN-NUR/TIM BRICKER Tele. No. (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	PH, EC	TOC	TOX	2,4-D; 2,4,5-TP SILVEX; ENDRIN; LINDANE; TOXA; METH	RADIUM GROSS ALPHA, BETA	COLIFORM BACTERIA
MW1/A/18/1-4	300423	X					
MW1/B/18/1-4			X				
MW1/C/18/1-4				X			
MW1/D/18					X		
MW1/E/18						X	
MW1/F/18							X
MW3/A/18/1-4	300440	X					
MW3/B/18/1-4			X				
MW3/C/18/1-4				X			
MW3/D/18					X		
MW3/E/18						X	
MW3/F/18							X

SAMPLE ANALYSIS REQUEST

Sampling Information

Project No. 85-01-4 **Project Name:** BERMITE 18TH. QTRLY. SAMPLING 317 AREA

Sampler Name: GLEN ABDUN-NUR / TIM BRICKER **Tele. No.** (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	pH + EC	TOC	TOX	2-4D, 2-4,5TP SILVEX END, LIND, TOXAPHANE METH.	RADIUM GROSS ALPHA BETA	COLIFORM BACTERIA
MW5/A/18/1-4	300441	X					
MW5/B/18/1-4			X				
MW5/C/18/1-4				X			
MW5/D/18					X		
MW5/E/18						X	
MW5/F/18							X
MW6/A/18/1-4	300442	X					
MW6/B/18/1-4			X				
MW6/C/18				X			
MW6/D/18					X		
MW6/E/18						X	
MW6/F/18							X

SAMPLE ANALYSIS REQUEST

Sampling Information AREA 317

Project No. 85-01.4 **Project Name:** BERMITE 18TH GREY WATER SAN

Sampler Name: GLEN ABBOTT / TIM BECKER **Tele. No.** (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	PHENOLS SEMI VOC'S	SULPHATE CHLORIDE	TOTAL PHOSPHATE	DISS. METALS W/SILVER	FLUORIDE	EPA 624 VOC'S
MW5/GP/18	300441	X					
MW5/H/18			X				
MW5/I/18				X			
MW5/K,M/18					X		
MW5/N/18						X	
MW5/O/18							X
MW6/GP/18	300442	X					
MW6/H/18			X				
MW6/I/18				X			
MW6/K,M/18					X		
MW6/N/18						X	
MW6/O/18							X

SAMPLE ANALYSIS REQUEST

Sampling Information

Project No. 85-01.4 Project Name: 317 AREA BERMITE 18TH. QTRLY SAMPLING

Sampler Name: GLEN ABDUN-NUR/TIM BRICKER Tele. No. (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	pH, EC	TOC	TOX	2,4-D, 2,4,5-TP SILVEX ENDRIN LINDANE TOXAPHENE METH.	RADIUM GROSS ALPHA BETA	COLIFORM BACTERIA
MW10/A/18/1-4	300449	X					
MW10/B/18/1-4			X				
MW10/C/18/1-4				X			
MW10/D/18					X		
MW10/E/18						X	
MW10/F/18							X

SAMPLE ANALYSIS REQUEST

AREA 317

Sampling Information

Project No. 85-01-4 Project Name: BERMITE 18TH QTRLY WATER SA

Sampler Name: GLEN ABBOUR / TIM BRICKER Tele. No. (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	PHENOLS SEMI VOC'S	SOLPHATE CHLORIDE	TOTAL PHOSPHATE	DISS METALS w/ SILVER	FLOURIDE	EPA 624 VOC'S
MW10/G,P/18	300449	X					
MW10/H/18			X				
MW10/I/18				X			
MW10/K,M/18					X		
MW10/N/18						X	
MW10/O/18							X

SAMPLE ANALYSIS REQUEST

Sampling Information

~~3~~ 317ARSA

Project No. 85-01.4 Project Name: BERMITE 18TH, QTRLY. SAMPLING EVENT

Sampler Name: GLEN ABDUN-NUR/TIM BRACKER Tele. No. (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	TOC	TOX	EPA 624 VOC'S			
MW5/B/18/1A	300450	X					
MW5/C/18/1A			X				
MW5/D/18/1A				X			
MW6/B/18/1A		X					
MW6/C/18/1A			X				
MW6/D/18/1A				X			

SAMPLE ANALYSIS REQUEST

317 AREA
342 AREA

Sampling Information

Project No. 85-01.4 Project Name: BERMITE QTRLY. SAMPLING EVEN 18TH & 7TH.

Sampler Name: GLEN ABRAHAMSON/TIM BRICKER Tele. No. (805) 259-2241

Name of Person Receiving Samples: Jeanine Egner

Date Samples Received: 1/27/93

Internal Temperature of Sample Container: 0°

Notes on Samples:

Analysis Required

Sample I.D.	Laboratory I.D.	FORMALDEHYDE					
MW1/Q/18	306437	X					
MW2/Q/7		X					
MW3/Q/18		X					
MW5/Q/18		X					
MW6/Q/18		X					
MW7/Q/7		X					
MW8/Q/7		X					
MW9/Q/7		X					
MW10/Q/18		X					

APPENDIX E

FGL QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) PROGRAM

EGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

Quality Assurance Manual

Corporate Offices & Laboratory
P.O. Box 272/853 Corporation Street
Santa Paula, CA 93061-0272
TEL: (805) 659-0910
FAX: (805) 525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: (209) 942-0181
FAX: (209) 942-0423

Field Office
Visalia, California
TEL: (209) 734-9473
Mobile: (209) 738-6273

ENVIRONMENTAL

ANALYTICAL CHEMISTS

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Corporate Offices & Laboratory
P.O. Box 272 / 853 Corporation Street

Office & Laboratory
2500 Stagecoach Road

Field Office
Visalia, California

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LIST OF FIGURES

I. Introduction

FGL, Inc. (FGL Environmental) has been serving California industries and governmental agencies on a continually expanding basis since 1925. Office and laboratory facilities are located in both Santa Paula and Stockton. FGL maintains a field office in the Visalia area to serve clients in the central and southern portions of the San Joaquin Valley. A field staff is available in all areas for the collection of samples. Through the use of the most modern instrumentation available and a highly qualified staff, FGL is capable of providing a broad range of organic, inorganic, toxicity, radioactivity and microbiological analyses on waters, wastewaters, soils and hazardous waste materials.

The purpose of this manual is to define and provide instructions for the quality assurance program used by FGL Environmental for its analytical laboratory operations. The objectives of the program are to control, assess, and document the quality of analytical data generated by FGL Environmental. The program achieves these objectives through two functions: (1) providing quality control data that can be used to determine analytical precision and accuracy and (2) controlling data quality within acceptance limits.

This manual identifies laboratory methods published by the U.S. Environmental Protection Agency and other authorities. It describes the quality control procedures to be used with the methods. It describes the overall approach used by FGL Environmental to ensure that the objectives of its QA/QC program are met. If necessary, more detailed procedures can be prepared on a project-specific basis.

II. Organization and Responsibilities

A). <u>Laboratory Personnel</u>

Darrell H. Nelson, B.S.	President/Lab Director-Santa Paula
John Quinn, Ph.D.	Vice President/Lab Director-Stockton
Steven D. Castellano, M.S.	Quality Assurance Director-Santa Paula
Dudley S. Jayasinghe, Ph.D.	Technical Director/Chemist - Santa Paula
Ricardo Sandoval, B.S.	Ag Lab Manager - Santa Paula
Kurt Wilkinson, B.S.	Inorganic Lab Manager-Santa Paula
Tiekang Huang, M.S.	Technical Director - Stockton
Thomas Bartanen, M.S.	Quality Assurance Officer - Stockton
Neil Jessup, B.S.	Agronomist - Visalia
Scott Bucy, B.S.	Agronomist - Santa Paula
Eric Cotting, M.S.	Computer Systems Mgr. - Santa Paula
Uday Y. Sathe, M.S.	Environmental Chemist - Santa Paula
Juan Manuel Magana, B.S.	Environmental Chemist - Santa Paula
Jeanine Egner, B.S.	Environmental Chemist - Santa Paula
Santos Marquez, B.A.	Environmental Chemist - Santa Paula
Michel Franco, B.A.	Environmental Chemist - Santa Paula
L. Burns	Environmental Chemist - Santa Paula

B). <u>Minimum Qualifications:</u>

Title: Chemist - B.S./B.A. degree in chemistry or closely related discipline, i.e. biology, environmental science, etc.

Title: Technician - No degree required. Training for tasks such as sample preparation and routine physical and chemical measurements must have been completed and documented by a qualified chemist. All laboratory work is to be supervised and reviewed by a qualified chemist.

C. Staff Background and Qualifications

Darrell H. Nelson	President/Lab Director-Santa Paula
Education:	B.S. (1970) in Soil and Water Science University of California, Davis.
Qualifications:	Mr. Nelson is the chief executive officer of the corporation, FGL, Inc. His previous experience relating to analytical chemistry includes five years of work as a bench chemist and supervisor of several major projects involving field sampling, laboratory analyses and report preparation. Mr. Nelson has been employed by FGL, Inc. since 1970.
John Quinn	Vice President - Lab Director - Stockton
Education:	B.A. (1965) in Chemistry, St. Peter's College C.Ph.1. (1972) in Organic Chemistry, U.C.L.A. Ph.D. (1973) in Organic Chemistry, U.C.L.A.
Qualifications:	Dr. Quinn is Vice President of the corporation, FGL, Inc. His previous experience includes supervision of major projects in the field of hazardous waste involving laboratory analyses, personnel assignment, client relations and report preparation. Dr. Quinn is currently serving as manager of the Stockton facility for the corporation.
Steven D. Castellano	Quality Assurance Director - Santa Paula
Education:	B.S. (1987) in Soil Science California Polytechnic State University San Luis Obispo M.S. (1990) in Soil Chemistry Oregon State University, Corvallis
Qualifications:	Mr. Castellano spent three years as a research assistant at the Soil Science Dept. of Oregon State University. He was in charge of several projects, all involving field sampling, analytical chemistry, computer applications, and technical report writing.

Dudley S. Jayasinghe	Technical Director - Santa Paula
Education:	Ph.D. in Analytical Chemistry with minor in organic chemistry and physical chemistry Oregon State University, Crovallis B.S. in Organic Chemistry minor in physics University of Peradeniya, Sri Lanka
Qualifications:	Mr. Jayasinghe is presently working as Technical Director at FGL Environmental. He has done post-doctoral research on soil chemistry at the Department of Soil Science at Oregon State University. He has been research assistant in the Department of Chemistry, Oregon State University. He has done research on the absorption and transport of organic pollutants in the environment. This includes analytical method development for the trace analysis of organic compounds. He was a teaching assistant in the Department of Chemistry at Oregon State University. He taught undergraduate and graduate courses on analytical instrumentation, quantitative analysis and general chemistry. His research includes supercritical fluid extraction methods and electrochemical detection of organic compounds. He was research officer in the processing research division of the Coconut Research Institute in Sri Lanka, and performed analysis on food products made out of coconut.
Ricardo Sandoval	Ag Lab Manager - Santa Paula
Education:	B.S. (1985) in Crop Science & 2 Year Technical Degree in Fruit Science University of California, San Luis Obispo
Qualifications:	Mr. Sandoval has six years experience using Flame Atomic Absorption, Inductively Coupled Argon Plasma, and Technicon Auto Analyzers for agricultural testing of soil and plant tissue samples.

Kurt Wilkinson	Inorganic Lab Manager - Santa Paula
Education:	B.S. (1987) Biochemistry California Polytechnic State University San Luis Obispo
Qualifications:	Mr. Wilkinson has over five years experience including agricultural testing of soil, plant tissue and food products as well as environmental testing of drinking water, wastewater, hazardous waste and airs. His most recent experience was managing a trace metals department for an environmental testing facility. Performing personnel assignment and client consultation on analysis needs and data interpretation. He is familiar with federal, state, and local inorganic testing procedures and QA/QC requirements.
Tiekang, Huang	Technical Director - Stockton
Education:	B.S. in Chemistry (1982) M.S. in Chemistry (1987) M.S. in Environmental Chemistry (1989)
Qualifications:	Mr. Huang has many years of experience in Environmental Analytical Chemistry using Flame AA and Graphite Furnace AA for various metal analyses, GC for volatile organics in water and soil and GC/MS for hazardous organics in wastewater according to EPA Methods.
Thomas Bartanen	Environmental Chemist
Education:	M.S. in Aquatic Ecology, 1987 University of Nevada, Las Vegas B.S. Environmental Science, 1980 Bradley University, Peoria, IL
Qualifications:	In addition to his chemistry and chromatographic experience, Mr. Bartanen has an interdisciplinary background which includes research in limnology and experience in microbiology and toxicology.

Neil Jessup	Agronomist - San Joaquin Valley
Education:	B.S. (1977) in Agronomy California Polytechnic State University San Luis Obispo
Qualifications:	Mr. Jessup has experience as a pest control advisor and operations manager for several farm management companies. He also has experience as a field representative for a soil, plant tissue and water laboratory.
James "Scott" Bucy	Agronomist - Santa Paula
Education:	B.S. (1977) in Soil Science California Polytechnical State University San Luis Obispo
Qualifications:	Mr. Bucy worked as a landscape contractor for nine years. He has also worked as a licensed agricultural pest control advisor and operator. He has been involved in plant, soil, and pest relationships for over fifteen years.
John Eric Cotting	Environmental Chemist - Santa Paula
Education:	B.S. Chemistry, 1981 University of Alaska, Fairbanks M.S. Chemistry, 1989 University of Wisconsin, Madison
Qualifications:	Mr. Cotting's undergraduate and graduate research experience is in the areas of physical chemistry involving both macro and small molecules. Previous work experience was in hazardous condition for the University of Alaska Fire Department and general laboratory skills and instrumental methods developed during his education training.

Uday Y. Sathe — Chemist

Education:

M.Sc. (1983) in Chemistry
University of Bombay, India
M.S. (1988) in Chemistry
Mississippi State University

Qualifications:

Research for masters thesis involved separation and identification of compounds like Benzene, Toluene, Chlorbenzene, Allyl Benzene, Chlorotoluene, Napthalene and Biphenyl resulting from vacuum pyrolysis of Allyl Chloride using GC and GC/FTIR.

Also used FTIR and Raman spectrometers for vibrational analysis of some bicycloheptanes.

Also taught general chemistry and senior level physical chemistry labs.

Research involved use of Nicolet 7199 Fourier Transform infared spectrometer with a liquid nitrogen cooled mercury-cadmium telluride (MCT) detector combined with a Nicolet 1280 computer.

Perkin Elmer Model 283 B grating spectrophotometer.

SPEX Ramalog DUV Spectrometer equipped to use the 488-nm line of spectraphysics Model 171 argon ion laser as the exitation source, to obtain the Raman spectra.

Varian 3700 gas chromatograph equipped with flame ionization detector (FID).

Varian-3700 gas chromatograph connected to the gold-coated, glass lightpipe equipped with KBR windows was used for GC/FTIR.

Mr. Sathe has been employed by FGL, Inc. since 1988.

Juan Manuel Magana	Chemist
Education:	B.S. (1987) in Soil Science University of Culiacan, Mexico
Qualification:	Mr. Magana is currently doing organic extractions for the corporation, FGL Environmental. His previous experience is as an assistant in a research project doing soil microbiology for six months.
Jeanine G. Egner:	Environmental Chemist - Santa Paula
Education:	B.S. (1987) in Environmental Systematic Biology California Polytechnic State University San Luis Obispo
Qualifications:	Ms. Egner is an Environmental Chemist responsible for a variety of organic and inorganic analyses in soil, water, and sludge. She also performs environmental assessments, field sampling, and hazardous waste site characterizations. She has over four years experience working in water quality control for government agencies and conducting environmental surveys in the environmental consulting industry.
Santos Marquez	Biologist - Santa Paula
Education:	B.A. in Biological Sciences, 1990 University of California, Santa Barbara
Qualifications:	Mr. Marquez has experience in laboratory work through courses at UC Santa Barbara.
Michel Franco	Environmental Chemist - Santa Paula
Education:	B.A. in Chemistry, 1990 California State University, Northridge
Qualifications:	Ms. Franco worked on the analysis of calcium in serum, using the A.A. at a major medical laboratory. She helped organize the specimen processing lab for greater efficiency. Was used as a liaison between lab sections for sample testing. Developed fool proof procedure for an Instrumental Analysis Class at CSUN. The analysis of trace zinc in water with a complexing reagent utilizing the A.A.

L. Burns — Chemist

Education: B.S. (1986) in Zoology, University of Idaho, Moscow

Qualifications: Instrumentation experience including the operation and maintenance of seven different models of Finnigan GC/MS systems, and the Hewlett Packard 5970 MSD.

Group leader experience including the development and implementing of quality control parameters, tracking of analyses through the laboratory to ensure technical compliance with established criteria. Scheduling and training of GC/MS chemists.

GC/MS analytical experience including analysis of soils, liquids, and hazardous wastes for volatiles and semivolatiles for the EPA contract laboratory program and for private industry.

Air toxics GC/MS chemist experience including the analysis of ambient air and source emissions by tedlar bag, summa canistor, carbon molecular sieve, tenax sorbent traps, and charcoal. These methods were achieved with the use of thermal desorption and/or cryogenic preconcentration techniques.

FIGURE II-1

ORGANIZATION CHART
FGL, INC.

President
Darrell H. Nelson

Vice President
John Quinn

Santa Paula
Laboratory Director
Darrell H. Nelson

Technical Director
Dudley Jayasinghe

Quality Assurance Director
Steve Castellano

Stockton
Laboratory Director
John Quinn

Santa Paula Laboratory

Organic Lab
Lab Manager
Dudley Jayasinghe

Chemists
Uday Sathe
Juan Magana
L. Burns

Inorganic Lab
Lab Manager
Kurt Wilkinson

Chemists
Santos Marquez
Jeanine Egner

Agricultural Lab
Lab Manager
Ricardo Sandoval

Technicians
Joan McKinney
Daniel Reyna

Radioactivity
Lab Manager
Steve Castellano

Chemists
Michel Franco

Bacteriologist
Raquel Harvey

Santa Paula
Sample Custodians
Maria Hernandez
Martha Hamblin

Computer Systems Manager
Eric Cotting

Accounting

Bookkeeper
Beverly Baca

Office

Office Manager
Kristie Marlow

Customer Services
Cindy Aguirre
Martha Hamblin
Maria Hernandez
Tiffany Douglas

Field Services

Agronomist
Scott Bucy

Agronomist
Neil Jessup

Field Supt.
George Trouw

Technicians
Pete Munoz

Stockton Laboratory

Laboratory Manager
John Quinn

Organic Lab

Chemist
Tom Bartanen

Inorganic Lab

Chemist
Tiekang Huang

Bacteriologist
Tinni Kar

Sample Custodian
Amelia De La Cruz

Office

Office Manager
Joanna Culham

Customer Service
Linda Quinn
Amelia De La Cruz

Field Services

Technician
Mark Brock

III. Sample Custody, Tracking, and Sampling Protocol

A). Sample Custody

It is essential to ensure sample integrity from collection to data reporting. This includes the ability to trace possession and handling of the sample from the time of collection through analysis and final disposition. This is referred to as chain-of-custody and is important in the event of litigation involving the results. Where litigation is not involved, chain-of-custody procedures are useful for routine control of sample flow.

A sample is considered to be under a person's custody if it is in the individual's physical possession, in the individual's sight, secured in a tamper-proof way by that individual, or is secured in an area restricted to authorized personnel. The following procedures summarize the major aspects of chain-of-custody. More detailed discussions are available.

1). <u>Sample Labels</u>: Use labels to prevent sample misidentification. Gummed paper labels or tags generally are adequate. Include at least the following information: Sample number, name of collector, date and time of collection, and place of collection.

Affix labels to sample containers before or at the time of sampling. Fill label out with waterproof ink at time of collection.

2). <u>Sample Seals</u>: Use sample seals to detect unauthorized tampering with samples up to the time of analysis. Use gummed paper seals that include, at least, the following information: Sample number (identical with number on sample label), collector's name, and date and time of sampling. Plastic shrink seals also may be used.

Attach seal in such a way that it is necessary to break it to open the sample container. Affix seal to container before sample leaves custody of sampling personnel.

3). <u>Field Log Book</u>: Record all information pertinent to a field survey or sampling in a bound log book. As a minimum, include the following in the log book; purpose of sampling; location of sampling point; name and address of field contact; producer of material being sampled and address, if different from location; and type of sample. If sample is wastewater, identify process producing waste stream. Also provide suspected sample composition, including concentrations; number and volume of sample taken; description of sampling point and sampling method; date and time of collection; collector's sample identification number(s); sample distribution and how transported; references such as maps or photographs of the sampling site; field observations and measurements; and signatures of personnel responsible for observations. Because sampling situations vary widely no general rule can be given as to the information to be entered in the log book. It is desirable to record sufficient information so that one could reconstruct the sampling without reliance on the collector's memory. Protect the log book and keep it in safe place.

4). Chain-of-Custody Record: Fill out a chain-of-custody record to accompany each sample or group of samples. The record includes the following information: sample number; signature of collector; date, time, and address of collection; sample type; signatures of persons involved in the chain of possession; and inclusive dates of possession.

5). Sample Delivery to Laboratory: Deliver sample to laboratory as soon as practicable. Accompany sample with chain-of-custody record and a sample analysis request sheet. Deliver sample to sample custodian.

6). Receipt and Logging of Sample: In the laboratory, the sample custodian receives the sample and inspects its condition and seal, reconciles label information and seal against the chain-of-custody record, assigns a laboratory number, logs sample in the laboratory computer, and stores it in a secured storage room or cabinet until it is assigned to an analyst.

7). Assignment of Sample for Analysis: The laboratory supervisor usually assigns the sample for analysis. Once in the laboratory, the supervisor or analyst is responsible for the sample's care and custody.

8). Safety Considerations: Because sample constituents can be toxic, take adequate precautions during sampling and sample handling. Toxic substances can enter through the skin and, in the case of vapors, through the lungs. Inadvertent ingestion can occur via direct contact with foods or by adsorption of vapors onto foods. Precautions may be limited to wearing gloves or may include coveralls, aprons, or other protective apparel. Always wear eye protection. When toxic vapors might be present, sample only in well-ventilated areas or use a respirator or self-contained breathing apparatus. In a laboratory, open sample containers in a fume hood. Never have food near samples or sampling locations; always wash hands thoroughly before handling food.

If flammable organic compounds may be present, take adequate precautions. Prohibit smoking near samples, sampling locations, and in the laboratory. Keep sparks, flames, and excessive heat sources away from samples, and sampling locations. Avoid buildup of flammable vapors in a refrigerator storing samples because electrical arcing at contacts of thermostat, the door-activated light switch, or other electrical components may trigger a fire or explosion. If flammable compounds are suspected or known to be present and samples are to be refrigerated, use only specially designed explosion-proof refrigerators.

When in doubt as to the level of safety precautions needed, consult an appropriately trained industrial hygienist. Samples with radioactive contaminants require other safety considerations; consult a health physicist.

B). <u>Laboratory Sample Control and Tracking</u>

FGL's sample control objectives are achieved through the use of the in-house Laboratory Information Management System (LIMS). LIMS is a computer software system specifically designed by FGL for tracking and handling of the large amount of information required to efficiently manage an analytical chemistry laboratory. The system provides a versatile, easy-to-use vehicle for the laboratory managers to obtain the information needed to make scheduling and priority decisions.

C). <u>FGL Sampling Protocol</u>

1). <u>Water Samples</u>: The result of any analytical determination can be no better than the sample on which it is performed. It is not practical to specify detailed procedures for the collection of all samples here because of varied purposes and analytical procedures. More detailed information appears in connection with specific methods. This section presents general considerations, applicable primarily to chemical analyses.

The objective of sampling is to collect a portion of material small enough in volume to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled. This objective implies that the relative proportions or concentrations of all pertinent components will be the same in the samples as in the material being sampled, and that the sample will be handled in such a way that no significant changes in composition occur before the tests are made.

A sample may be presented to the laboratory for specific determinations with the collector taking responsibility for its validity. Often, in water and wastewater work, the laboratory conducts or prescribes the sampling program, which is determined in consultation with the user of the test results. Such consultation is essential to insure selecting samples and analytical methods that provide a true basis for answering the questions that prompted the sampling.

a). <u>General Precautions</u>: Obtain a sample that meets the requirements of the sampling program and handle it in such a way that it does not deteriorate or become contaminated before it reaches the laboratory. Before filling, rinse sample bottle two or three times with the water being collected, unless the bottle contains a preservative or dechlorinating agent. Depending on determinations to be performed, fill container full (most organics determinations) or leave space for aeration, mixing, etc. (microbiological analyses). For samples that will be shipped, preferably leave an air space of about one (1) percent of container capacity to allow for thermal expansion.

Special precautions are necessary for samples containing organic compounds and trace metals. Because many constituents may be present at concentrations of micrograms per liter, they may be totally or partially lost if proper sampling and preservation procedures are not followed.

Representative samples of some sources can be obtained only by making composites of samples collected over a period of time or at many different sampling points. The details of collection vary so much with local conditions that no specific recommendations would be universally applicable.

Sometimes it is more informative to analyze numerous separate samples instead of one composite so as not to obscure maxima and minima.

Sample carefully to insure that analytical results represent the actual sample composition. Important factors affecting results are the presence of suspended matter or turbidity, the method chosen for its removal, and the physical and chemical changes brought about by storage or aeration. Particular care is required when processing (grinding, blending, sieving, filtering) samples to be analyzed for trace constituents, especially metals and organic compounds. Some determinations, particularly of lead, can be invalidated by contamination from such processing. Treat each sample individually with regard to the substances to be determined, the amount and nature of turbidity present, and other conditions that may influence the results.

It is impractical to give directions covering all conditions, and the choice of technique for collecting a homogeneous sample must be left to the analyst's judgment. In general, separate any significant amount of suspended matter by decantation, centrifugation, or an appropriate filtration procedure. Often a slight turbidity can be tolerated if experience shows that it will cause no interference in gravimetric or volumetric tests and that its influence can be corrected in colorimetric tests, where it has potentially the greatest interfering effect. When relevant, state whether or not the sample has been filtered. To measure the total amount of a constituent, do not remove suspended solids, but treat them appropriately.

Make a record of every sample collected and identify every bottle, preferably by attaching an appropriately inscribed tag or label. Record sufficient information to provide positive sample identification at a later date, including the name of the sample collector, the date, hour, and exact location, the water temperature, and any other data that may be needed for correlation, such as weather conditions, water level, stream flow, post-sampling handling, etc. Provide space on the label for the initials of those assuming sample custody and for the time and date of transfer. Fix sampling points by detailed description, by maps, or with the aid of stakes, buoys, or landmarks in a manner that will permit their identification by other persons without reliance on memory or personal guidance. Particularly when sample results are expected to be involved in litigation, use formal "chain-of-custody" procedures which trace sample history from collection to final reporting.

Cool hot samples collected under pressure while they are still under pressure.

Before collecting samples from distribution systems, flush lines sufficiently to insure that the sample is representative of the supply, taking into account the diameter and length of the pipe to be flushed and the velocity of flow.

Collect samples from wells only after the well has been pumped sufficiently to insure that the sample represents the groundwater source. Sometimes it will be necessary to pump at a specified rate to achieve a characteristic drawdown, if this determines the zones from which the well is supplied. Record pumping rate and drawdown.

When samples are collected from a river or stream, observed results may vary with depth, stream flow, and distance from shore and from one shore to the other. If equipment is available, take an "integrated" sample from top to bottom in the middle of the stream or from side to side at mid-depth.

Lakes and reservoirs are subject to considerable variations from normal causes such as seasonal stratification, rainfall, runoff, and wind. Choose location, depth, and frequency of sampling depending on local conditions and the purpose of the investigation. Avoid surface scum.

For certain constituents, sampling location is extremely important. Avoid areas of excessive turbulence because of potential loss of volatile constituents and of potential presence of toxic vapors. Avoid sampling at weirs because such locations tend to favor retrieval of lighter-than-water, immiscible compounds. Generally, collect samples beneath the surface in quiescent areas. If composite samples are required, take care that sample constituents are not lost during compositing because of improper handling of portions being pooled. For example, casual dumping together of portions rather than addition to the composite through a submerged siphon can cause unnecessary volatilization.

Use only representative samples (or those conforming to a sampling program) for examination. The great variety of conditions under which collections must be made makes it impossible to prescribe a fixed procedure. In general, take into account the tests or analyses to be made and the purpose for which the results are needed.

b). <u>Types of Samples</u>

1). <u>Grab or Catch Samples</u>: Strictly speaking, a sample collected at a particular time and place can represent only the composition of the source at that time and place. However, when a source is known to be fairly constant in composition over a considerable period of time or over substantial distances in all directions, then the sample may be said to represent a longer time period or a larger volume, or both, than the specific point at which it was collected. In such circumstances, some sources may be represented quite well by single grab samples.

Examples are some water supplies, some surface waters, and rarely, some wastewater streams. When a source is known to vary with time, grab samples collected at suitable intervals and analyzed separately can document the extent, frequency, and duration of these variations. Choose sampling intervals on the basis of the frequency with which changes may be expected, which may vary from as little as five (5) minutes to as long as one (1) hour or more. Seasonal variations in natural systems may necessitate sampling over months. When the source composition varies in space rather than time, collect samples from appropriate locations.

Use great care in sampling wastewater sludges, sludge banks, and muds. No definite procedure can be given, but take every possible precaution to obtain a representative sample or one conforming to a sampling program.

2). <u>Composite Samples</u>: In most cases, the term "composite sample" refers to a mixture of grab samples collected at the same sampling point at different times. Sometimes the term "time-composite" is used to distinguish this type of sample from others. Time-composite samples are most useful for observing average concentrations that will be used, for example, in calculating the loading or the efficiency of a wastewater treatment plant. As an alternative to the separate analysis of a large number of samples, followed by computation of average and total results, composite samples represent a substantial saving in laboratory effort and expense. For these purposes, a composite sample representing a 24 hour period is considered standard for most determinations. Under certain circumstances, however, a composite sample representing one shift, or a shorter time period, or a complete cycle of a periodic operation, may be preferable. To evaluate the effects of special, variable, or irregular discharges and operations, collect composite samples representing the period during which such discharges occur.

For determining components or characteristics subject to significant and unavoidable changes on storage, do not use composite samples. Make such determinations on individual samples as soon as possible after collection and preferably at the sampling point. Analyses for all dissolved gases, residual chlorine, soluble sulfide, temperature, and pH are examples of this type of determination. Changes in such components as dissolved oxygen or carbon dioxide, pH, or temperature may produce secondary changes in certain inorganic constituents such as iron, manganese, alkalinity, or hardness. Use time-composite samples only for determining components that can be demonstrated to remain unchanged under the conditions of sample collection and preservation.

Take individual portions in a wide-mouth bottle having a diameter of at least 35 mm at the mouth and a capacity of at least 120 mL. Collect these portions every hour - in some cases every half hour or even every five (5) minutes - and mix at the end of the sampling period or combine in a single bottle as collected. If preservatives are used, add them to the sample bottle initially so that all portions of the composite are preserved as soon as collected. Analysis of individual samples sometimes may be necessary. It is desirable, and often essential, to combine individual samples in volumes proportional to flow. A final sample volume of 2 to 3 L is sufficient for sewage, effluents, and wastes.

Automatic sampling devices are available; however, do not use them unless the sample is preserved as described below. Clean sampling devices, including bottles, daily to eliminate biological growths and other deposits.

3). Integrated Samples: For certain purposes, the information needed is provided best by analyzing mixtures of grab samples collected from different points simultaneously, or as nearly so as possible. Such mixtures sometimes are called integrated samples. An example of the need for such sampling occurs in a river or stream that varies in composition across its width and depth. To evaluate average composition or total loading, use a mixture of samples representing various points in the cross-section, in proportion to their relative flows. The need for integrated samples also may exist if combined treatment is proposed for several separate wastewater streams, the interation of which may have a significant effect on treatability or even on composition. Mathematical prediction of the interactions may be inaccurate or impossible and testing a suitable integrated sample may provide more useful information.

Both natural and artificial lakes show variations of composition with both depth and horizontal location. However, under many conditions, neither total nor average results are especially significant; local variations are more important. In such cases, examine samples separately rather than integrate them.

Preparation of integrated samples usually requires special equipment to collect a sample from a known depth without contaminating it with overlying water. Knowledge of the volume, movement, and composition of the various parts of the water being sampled usually is required. Therefore, collecting integrated samples is a complicated and specialized process that cannot be described in detail.

2). Hazardous Waste Samples

a). Volatile Organics: Standard 40 mL glass screw-cap VOA vials with Teflon-faced silicone septum may be used for both liquid and solid matrices. The vials and septum should be soap and water washed and rinsed with distilled deionized water. After thoroughly cleaning the vials and septum, they should be placed in a muffle furnace and dried at 150 C for approximately one hour. (Note: Do not heat the septum for extended periods of time, i.e., more than one hour, because the silicone begins to slowly degrade at 105 C).

When collecting the samples, liquids and solids should be introduced into the vials gently to reduce agitation which might drive off volatile compounds. Liquid samples should be poured into the vial without introducing any air bubbles within the vial as it is being filled. Should bubbling occur as a result of violent pouring, the sample must be poured out and the vial refilled. Each VOA vial should be filled until there is a meniscus over the lip of the vial. The screw-top lid with the septum (Teflon side toward the sample) should then be tightened onto the vial. After tightening the lid, the vial should be inverted and tapped to check for air bubbles. If there are any air bubbles present the sample must be retaken. Two VOA vials should be filled per sample location.

VOA vials for samples with solid or semi-solid (sludges) matrices should be completely filled as best as possible. The vials should be tapped slightly as they are filled to try and eliminate as much free air space as possible. Two vials should also be filled per sample location.

VOA vials should be filled and labeled immediately at the point at which the sample is collected. They should NOT be filled near a running motor or any type of exhaust system because discharged fumes and vapors may contaminate the samples. The two vials from each sampling location should then be sealed in separate plastic bags to prevent cross-contamination between samples particularly if the sampled waste is suspected of containing high levels of volatile organics. (Activated carbon may also be included in the bags to prevent cross-contamination from highly contaminated samples). VOA samples may also be contaminated by diffusion of volatile organics through the septum during shipment and storage. To monitor possible contamination, a trip blank prepared from distilled deionized water should be carried throughout the sampling, storage, and shipping process.

b). Semivolatile Organics: (This includes Pesticides and Herbicides) Containers used to collect samples for the determination of semivolatile organic compounds should be soap and water washed followed by methanol (or isopropanol) rinsing. The sample containers should be of glass or Teflon and have screw-top covers with Teflon liners. In situations where Teflon is not available, samples may react with the aluminum foil, causing eventual contamination of the sample. Plastic containers or lids may NOT be used for the storage of samples due to the possibility of sample contamination from the phthalate esters and other hydrocarbons within the plastic. Sample containers should be filled with care so as to prevent any portion of the collected sample coming in contact with the sampler's gloves, thus causing contamination. Samples should not be collected or stored in the presence of exhaust fumes. If the sample comes in contact with the sampler (e.g., if an automatic sampler is used), run reagent water through the sampler and use as a field blank.

c). Trace Metals: In the determination of trace metals, containers can introduce either positive or negative errors in the measurement of trace metals by (a) contributing contaminants through leaching or surface desorption, and (b) depleting concentrations through adsorption. Thus the collection and treatment of the sample prior to analysis require particular attention.

3). Underground Storage Tank Samples

a). Field Notebook: The field investigator should keep a field notebook (preferably bound with pages numbered) to record sample collection procedures, dates, laboratory identification, sample collection location, and the name of the sampler. This is important for later recall or legal challenge.

b). Soil Samples

1). Hydrocarbons: Soil samples collected from a backhoe, the ground or a soil coring device, should be collected in a thin-walled stainless steel or brass cylinder at least three inches long by one inch in diameter that has been prepared by the laboratory doing the analysis or the project consultant (cylinders can be made to fit inside the preferred split-barrel core sampler). About one inch of soil should be removed from the immediate surface area where the sample is to be taken and the cylinder then pounded into the soil with a wooden mallet. No headspace should be present in the cylinder once the sample is collected. When the sample is collected, each end of the cylinder should be covered with aluminum foil and then capped with a polyethylene lid, taped, and labeled. The sample should then be immediately placed in an ice chest containing dry ice and kept frozen for delivery to the laboratory. Care should be taken throughout to avoid contamination of both the inside and outside of the cylinder and its contents.

Samples should be kept frozen at the laboratory until they are analyzed. Holding time should not exceed 14 days from the time of collection. Frozen soil cores should be removed from the cylinders by spot heating the cylinder and immediately extruding the sample (or a portion of it). A portion of the frozen sample should be removed and prepared for analysis according to approved EPA methods.

In situations where the above procedure is inappropriate, i.e. semi-solid samples, glass vials (properly prepared by contract laboratory consultant) with Teflon seal and screw cap should be used, and maintained at 4 C until analysis.

2). Organic Lead: Tetraethyl/tetramethyl-lead are volatile; therefore, soil samples should be collected in cylinders and frozen as described for volatile hydrocarbons above.

3). Shipping Samples: Where commercial shippers are involved, dry ice may present Department of Transportation (DOT) shipping problems and "blue ice" may have to be substituted.

4). Water Samples

Free Floating Product (from a well): Sampling of free floating product on the surface of ground water should not be performed until the well has been allowed to stabilize for at least 24 hours after development or other withdrawal procedure. A sample should be collected that is indicative of the thickness of floating product within the monitoring well. This may be accomplished by the use of a clear, acrylic bailer designed to collect a liquid sample where free product and ground water meet. A graduated scale on the bailer is helpful for determining the thickness of free product. Samples should be field-inspected for the presence of odor and/or sheen in addition to the above evaluation.

Electronic measuring devices also are available for determining the thickness of the hydrocarbon layer floating on ground water.

5). Dissolved Product (from a well): If free product is detected, analysis of water for dissolved product should be conducted after the free product has been substantially removed from the well. Before collecting a water sample, a well should be purged until temperature, conductivity and pH stabilize. Often, this will require removal of four or more well volumes by bailing or pumping. Once well volumes are removed and well water is stabilized, a sample can be taken after the water level approaches 80 percent of its initial level. Where water level recovery is slow, the sample can be collected after stabilization is achieved.

Ground water samples should be collected in a manner which reduces or eliminates the possibility of loss of volatile constituents from the sample. For collecting samples, a gas-actuated positive displacement pump or a submersible pump is preferred. A Teflon or stainless steel bailer is acceptable. Peristaltic pumps or airlift pumps should not be used.

Cross-contamination from transferring pumps (or bailers) from well to well can occur and should be avoided by thorough cleaning between sampling episodes. Dedicated (i.e., permanent installation) well pumps, while expensive, are often cost effective in the long term and ensure data reliability relative to cross-contamination. If transfer of equipment is necessary, sampling should proceed from the least contaminated to the most contaminated well, if the latter information is available before sample collection.

Water samples should be collected in vials or containers specifically designed to prevent loss of volatile constituents from the sample. These vials should be provided by an analytical laboratory, and preferably, the laboratory conducting the analysis. No headspace should be present in the sample container once the container has been capped. This can be checked by inverting the bottle, once the sample is collected, and looking for bubbles. Sometimes it is not possible to collect a sample without air bubbles, particularly if water is aerated. In these cases, the investigator should record the problem and account for probable error. Cooling samples may also produce headspace (bubbles), but these will disappear once the sample is warmed for analysis.

Samples should be placed in an ice chest maintained at 4 C with blue ice (care should be taken to prevent freezing of the water and bursting of the glass vial). A thermometer with a protected bulb should be carried in each ice chest.

6). Surface Water: Grab samples should be collected in appropriate glass containers supplied by the laboratory. The sample should be collected in such a manner that air bubbles are not entrapped. Semisolid samples should be collected the same way. The collected samples should be refrigerated (blue ice, 4 C) for transport and analyzed within seven (7) days of collection (14 days with preservatives).

4). Pesticide Residue Sampling Procedures

a). Samples Regarding Re-entry/Worker Safety: All samples should be from the plant foliage (leaf tissue) when pesticides are applied to the foliage. Sometimes areas other than the plant foliage may be in question, such as the dripline area surface soil and/or the leaf duff (leaf litter) under the trees. The sample should be large enough to fill a normal "lunch bag" and be taken from several plantings.

b). Samples Regarding Consumer Safety: The edible portion of the plant or fruit should be collected. The sample should contain approximately one (1) pound of material taken from several plants. Usually six to eight whole plants or fruit pieces will make up a good sample.

D). Sample Handling Policy

1). Sample Handling Instructions

a). Sample Container & Volume - The use of proper sample containers holding an appropriate volume of sample is essential to FGL Environmental's quality assurance program. The Recommended Sample Collection and Preservation shows the type of containers and the volume required for each analysis.

b). Sample Preservation - The proper preservation of samples is a fundamental element of FGL Environmental's quality assurance program. The Recommended Sample Collection and Preservation shows the preservation measures required for each analysis. FGL Environmental's staff follows methods listed in the Handbook for Sampling and Sample Preservation of Water and Wastewater. U.S. EPA Monitoring and Support Laboratory; Cincinnati, Ohio; September 1982.

c). Sample Holding Times - Strict observance of the holding time requirement for each type of analyses is essential to FGL Environmental's quality assurance program. The Recommended Sample Collection and Preservation shows the maximum allowable holding times for each analysis.

The information given in The Recommended Sample Collection and Preservation is based on recommendations in EPA Methods for Chemical Analysis of Water and Wastewater (EPA-600/4-79-020) and EPA Test Methods for Evaluating Solid Waste (SW-846).

2). Sample Receiving Policy

a). Obtain the following client information and place on customer lab ticket:

Billing Name:
Address:
Phone Number:
Person to Contact:
Report Form Required: ____ State ____ FGL
Is Chain of Custody required ____ Yes ____ No

b). Determine the analyses needed and indicate on customer lab ticket:

1). Use EPA Method Number or list elements
2). Determine if preservatives have been added

c). Determine turn-around-time requirement: ______Rush ______Non-Rush
Indicate on the customer lab ticket and the laboratory work sheet if a rush is required. The red colored rush stamp is to be used for this purpose.

d). Inspect the sample for the following:

1). Have holding times been observed and determine if it is possible for FGL to meet holding times? (See attached holding time requirements)
2). Is the sample size adequate?
3). Is the sample container satisfactory? (See attached sample container requirements)
4). Note sample condition

Broken/leaking container
Custody Seal ______Intact ______ Broken
Temperature ______Ambient ______Chilled
Record Actual Temperature
Check for headspace when appropriate

Make note of any problems with sample condition on the customers lab ticket, the person notified, time and date notified, and customers response, if any.

Check all samples for radioactivity analyses and hazardous waste evaluation for radio chemical hazard using the Model 3 Survey Meter kept in the log-in room. If the sample is found to have a reading of 0.3 mrads/hour or greater; then, the sample must be refused.

e). Log the sample information into the laboratory computer under one of the following categories: Inorganic Drinking and Wastewater Lab Samples, Organic Lab Samples, Radioactivity Lab Samples, and Ag Lab Samples.

f). Transfer samples and analyses instructions (lab work sheets) to the appropriate refrigerator or lab work distribution area. See the attached sheet titled "Sample Storage and Distribution Policy".

FRUIT GROWERS LABORATORY, INC.

FIGURE III-1

CHAIN-OF-CUSTODY

Date: ____________________

Client: ____________________

Address: ____________________

____

Phone: (____)-____-______

Fax: (____)-____-______

Project name: ____________________

Contact person: ____________________

Sampler(s): ____________________

Comp sampler setup:Date:___/___/___ Time:___:___

Time: ____________ Mileage: __________

Purchase order number: ____________________

QA/QC report required: Yes____ No____

Lab number: ____________________

Sample Number	Location/Description	Date Sampled	Time Sampled	Type of Sample: Composite(C) Grab (G)	Number of Containers	Type of Containers: (B)Brass (V) VOA (G) Glass (P) Plastic	(S) Soil (SL)Sludge (O) Oil	(SW) Surface Water (MW) Monitoring Well (GW) Ground Water (TB) Travel Blank (WW) Wastewater (S) Spike (DW) Drinking Water	(P) Potable (NP) None Potable	Preservative:NaHSO4, HCL, H2SO4, HNO3, pH <2 NaOH pH > 9 or pH > 12 ; Na2S2O3 if chlorinated Other									Sample Condition: Temperature____ (L) Leaking, (B) Broken (HS) VOA Headspace	Custody Seal (Y) (N)

Misc. notes:

Rush results due by:
Final sample disposition:

Lab disposal:__________ Return to Client:________

Meth. of disp.:________ Date of ret.:___/___/___

Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Corporate Offices & Laboratory
[illegible]

Office & Laboratory
[illegible]

Field Office
Visalia, California
TEL: (209) 734 9173
Mobile: (209) [illegible]

TABLE III-1

Recommended Sample Collection and Preservation

Analysis	Container	Volume (mL)	Preservation	Holding Time
General Inorganic Chemistry				
Acidity	P,G	250	Cool, 4 C	14 days
Alkalinity	P,G	250	Cool, 4 C	14 days
Ammonia	P,G	250	H2SO4, pH <2; Cool, 4 C	28 days
Bicarbonate	P	250	Cool, 4 C	14 days
Biochemical Oxygen Demand	P,G	1000	Cool, 4 C	48 hours
Boron	P	100	Cool, 4 C	28 days
Carbonate	P	250	Cool, 4 C	14 days
Carbon Dioxide	P,G	250	Cool, 4 C	Analyze immed.
Chemical Oxygen Demand	P,G	100	H2SO4, pH <2; Cool, 4 C	28 days
Chloride	P,G	100	Cool, 4 C	7 days
Chlorine Residual	P,G	500	Cool, 4 C	2 hours
Chlorine Demand	P,G	2000	Cool, 4 C	2 hours
Color	P,G	100	Cool, 4 C	48 hours
Cyanide, Total	P,G	1000	NaOH, pH >12; Cool, 4 C	14 days
Electrical Conductivity	P	100	Cool, 4 C	28 days
Fluoride	P,G	100	Cool, 4 C	7 days
Hardness, Total	P,G	100	HNO3, pH <2; Cool, 4 C	6 months
Hydroxide	P	250	Cool, 4 C	14 days
Langelier Index	P,G	500	Cool, 4 C	2 hours
MBAS	P,G	500	Cool, 4 C	24 hours
Nitrogen,				
Ammonia	P,G	100	H2SO4, pH <2; Cool, 4 C	28 days
Nitrate	P,G	100	H2SO4, pH <2; Cool, 4 C	28 days
			w/o preservation	48 hours
Nitrite	P,G	100	Cool, 4 C	48 hours
Organic	P,G	400	H2SO4, pH <2; Cool, 4 C	28 days
Total	P,G	100	H2SO4, pH <2; Cool, 4 C	28 days
Total Kjeldahl	P,G	200	H2SO4, pH <2; Cool, 4 C	28 days
Odor	G	500	Cool, 4 C	48 hours
Oil and Grease	G	1000	H2SO4, pH <2; Cool, 4 C	28 days
Oxygen, Dissolved	G, w/glass stopper	300	Cool, 4 C	Analyze immed.
pH	P,G	50	Cool, 4 C	2 hours
Phenolics	G, amber	500	H2SO4, pH <2; Cool, 4 C	28 days
Phosphorus				
Ortho or Dissolved	P,G	100	Cool, 4 C	48 hours
Total	P,G	50	H2SO4, pH <2; Cool, 4 C	28 days
Resistivity	P	100	Cool, 4 C	28 days
Silica	P	50	Cool, 4 C	28 days
Sodium Percent	P	200	Cool, 4 C	6 months
Sodium Absorption Ratio	P	200	Cool, 4 C	6 months

P = plastic, G = glass
All solid samples should be kept cool at 4 C

TABLE III-1 (cont'd.)

Recommended Sample Collection and Preservation

Analysis	**Container**	**Volume (mL)**	**Preservation**	**Holding Time**
General Inorganic Chemistry continued				
Solids,				
Filterable	P,G	100	Cool, 4 C	7 days
Non-filterable	P,G	100	Cool, 4 C	7 days
Total	P,G	100	Cool, 4 C	7 days
Volatile	P,G	100	Cool, 4 C	7 days
Settleable	P,G	1000	Cool, 4 C	48 hours
Sulfate	P,G	200	Cool, 4 C	28 days
Sulfide				
Total	P,G	600	2 ml ZnC2H3O2 plus NaOH to pH >9	7 days
Dissolved	P,G	500	Cool, 4 C	24 hours
Tannin & Lignin	G	250		
Titration - pH adjustment	P,G	250	Cool, 4 C	14 days
Turbidity	P,G	100	Cool, 4 C	48 hours
Trace Metals				
Chromium VI	P,G	500	Cool, 4 C	24 hours
Mercury	P,G	200	HNO3, pH <2	28 days
All other metals	P	200	HNO3, pH <2	6 months
Radio Chemical				
Gross Alpha & Beta*	P	1000	HNO3, pH <2	6 months
Total Radium	P	1000	HNO3, pH <2	28 days
Total Uranium	P	1000	HCl, pH <2	6 months
Radon	G	2 x 250	Cool, 4 C	36 hours
Tritium	G	250	Cool, 4 C	N/A
Strontium 90	P	1000	HCl, pH <2	6 months

* For non-preserved samples, the holding time is 5 days. For preserved samples, please provide either a non-preserved sample (100 mL) or the E.C. (obtained prior to acidification).

Bacteriological				
Coliform-Fecal & Total	P,G	100	0.008% Na2S2O3; Cool, 4 C	30 hours

Note: All solid samples should be collected in stainless steel sleeves, brass sleeves or in amber glass jars all with teflon-lined caps and 100-250g capacity. All solid samples should be kept cool at 4 C.

P = plastic, G = glass

TABLE III-1 (cont'd.)

Recommended Sample Collection and Preservation

Analysis	Container	Volume (mL)	Preservation	Holding Time
Organic Chemicals*				
Drinking Water				
Title 22 Organics (EPA 505 & 515)	Amber glass TFE-lined cap	2 x 125 1 x 1000	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 501	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated HCl or NaHSO4 pH <2 Cool, 4 C	14 days
EPA 502.2	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated HCl pH <2; Cool, 4 C	14 days
EPA 504	Glass TFE-septa cap	2 x 125	Cool, 4 C	28 days
EPA 505	Glass TFE-septa cap	2 x 125	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 507	Amber glass TFE-lined cap	1 x 1000	Na2S2O3, if chlorinated or HCl pH <2; Cool, 4 C	14 days
EPA 508	Amber glass TFE-lined cap	1 x 1000	Cool, 4 C	7 days**
EPA 515	Amber glass TFE-lined cap	1 x 1000	Cool, 4 C	7 days**
EPA 515.1	Amber glass TFE-lined cap	1 x 1000	Cool, 4 C	7 days**
EPA 524.2	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated or HCl pH <2; Cool, 4 C	14 days
EPA 525	Amber glass TFE-lined cap	2 x 1000	Cool, 4 C	7 days**
EPA 531	Amber glass	250	Na2S2O3, if chlorinated Monochloroacetic acid, (suggested) pH=3	14 days
EPA 547	Amber glass	125	Na2S2O3, if chlorinated Cool, 4 C	14 days

* No head space over sample.
** This is the maximum holding time prior to extraction. The extracted sample may be held up to 40 days before analysis.

TABLE III-1 (cont'd.)

Recommended Sample Collection and Preservation

Analysis	Container	Volume (mL)	Preservation	Holding Time
Organic Chemicals*				
Wastewater and Hazardous Waste				
EPA 601/8010	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated HCl or NaHSO4, pH <2 Cool, 4 C	14 days
EPA 602/8020	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated HCl or NaHSO4, pH <2 Cool, 4 C	14 days
EPA 603/8030	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated Adjust pH to 4-5 Cool, 4 C	14 days
EPA 604/8040	Amber glass TFE-lined cap	1 x 1000	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 608/8080	Amber glass TFE-lined cap	1 x 1000	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 614/8140	Amber glass TFE-lined cap	1 x 1000	Cool, 4 C	7 days**
EPA 615/8150	Amber glass TFE-lined cap	1 x 1000	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 619	Amber glass TFE-lined cap	1 x 1000	Cool, 4 C	14 days
EPA 624/8240	Glass (VOA) TFE-septa cap	2 x 40	Na2S2O3, if chlorinated HCl, pH <2; Cool, 4 C	14 days
EPA 625/8270	Amber glass TFE-lined cap	1 x 1000	Na2S2O3, if chlorinated Cool, 4 C	7 days**
EPA 9020 (TOX)	Amber glass TFE-lined cap	250	H2SO4, pH <2 Cool, 4 C	14 days* 7 days***

Note: All solid samples should be collected in stainless steel sleeves, brass sleeves or in amber glass jars all with teflon-lined caps and 100-250g capacity. All solid samples should be kept cool at 4 C.

* No head space over sample.
** This is the maximum holding time prior to extraction. The extracted sample may be held up to 40 days before analysis.
*** RCRA holding time is 7 days.

TABLE III-1 (cont'd.)

Recommended Sample Collection and Preservation

Analysis	Container	Volume (mL)	Preservation	Holding Time
Organic Chemicals*				
Wastewaters and Hazardous Waste				
EPA 415.1 (TOC)	Amber glass TFE-lined cap	250	HCl or H2SO4, pH <2 Cool, 4 C	28 days
EPA 9060	See solids note	250 g	Cool, 4 C	N/A
DBCP and/or EDB	Amber glass TFE-lined cap	2 x 125	Na2S2O3, if chlorinated HCl pH <2, Cool, 4 C	7 days**
TCE and/or PCE	Amber glass TFE-lined cap	2 x 125	Na2S2O3, if chlorinated HCl pH <2, Cool, 4 C	7 days**
Underground Storage Tank Analyses*				
EPA 8015, 8015M, 418.1	Glass (VOA) TFE-septa cap	2 x 40	HCl, pH <2 Cool, 4 C	14 days
EPA 602/8020	Glass (VOA) TFE-septa cap	2 x 40	HCl or NaHSO4, pH <2 Cool, 4 C	14 days
EPA 8010	Glass (VOA) TFE-septa cap	2 x 40	HCl or NaHSO4, pH <2 Cool, 4 C	14 days
EPA 7421/7420 (Total Lead)	Plastic/Glass	200	HNO3, pH <2 Cool, 4 C	6 months
EPA 7420 (Soluble Lead)	Plastic/Glass	200	Cool, 4 C	14 days

Note: All solid samples should be collected in stainless steel sleeves, brass sleeves or in amber glass jars all with teflon-lined caps and 100-250g capacity. All solid samples should be kept cool at 4 C.

* No head space over sample.
** This is the maximum holding time prior to extraction. The extracted sample may be held up to 40 days before analysis.

TABLE III-1 (cont'd.)

Recommended Sample Collection and Preservation

Analysis	**Container**	**Volume (mL)**	**Preservation**	**Holding Time**
Hazardous Waste Characterization				
Corrosivity	Glass/plastic	100	Cool, 4 C	7 days
Ignitability	Glass TFE-lined cap	100	Cool, 4 C	7 days
Reactivity				
Reactions	Glass TFE-lined cap	100	Cool, 4 C	7 days
Sulfide/Cyanide generation	Glass TFE-lined cap	100	Cool, 4 C	7 days
TCLP and EP Toxicity				
Metals	Glass TFE-lined cap	500	Cool, 4 C	30 days
Pesticides	Amber glass TFE-lined cap	1000	Cool, 4 C	7 days**
Herbicides	Amber glass TFE-lined cap	1000	Cool, 4 C	7 days**
Bioassays				
Toxicity Bioassay	Glass/plastic	30 L	Cool, 4 C	24 hours
Calif. Acute Toxicity	Glass/plastic	25 L	Cool, 4 C	24 hours
Definitive	Glass/plastic	60 L	Cool, 4 C	24 hours

Note: All solid samples should be collected in stainless steel sleeves, brass sleeves or in amber glass jars all with teflon-lined caps and 100-250g capacity. All solid samples should be kept cool at 4 C.

** This is the maximum holding time prior to extraction. The extracted sample may be held up to 14 days before analysis.

IV. Analytical Procedures

A). Method Sources

The analytical methods used by FGL are primarily those published by the U.S. Environmental Protection Agency. Some methods are from Standard Methods for the Examination of Water and Waste Water, 17th Edition, APHA-AWWA-WPCF, 1989. Other methods are used, when applicable, according to project specific requirements.

FGL uses methods found in the following EPA Manuals:

Procedures Manual for Ground water Monitoring at Solid waste disposal Facilities, EPA SW-600.

EPA Test methods for Evaluating Solid Waste, EPA SW-846.

EPA Methods of Chemical Analysis in Waters and Wastewaters (MCAWW) EPA-600/4-79-020)

Prescribed Procedures for Measurement of Radioactivity in Drinking Water (EPA-600/4-80-032)

B). Specific Methods Used

The analytical methods performed at FGL fall into four general categories: Drinking water methods, waste water and groundwater methods, hazardous waste methods, and sludge methods. These methods are listed in Tables IV-1 through IV-4.

Table IV-1

DRINKING WATER METHODS

Parameter	Method	Description
Organic Chemicals		
Chlorinated Pesticides & Herbicides Alachlor, Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Lindane, Methoxychlor, PCB's, Toxaphene, Bentazon, 2,4-D, 2,4,5-TP (Silvex)	EPA 505 & 515.1 (Title 22)	GC/ECD, micro extraction/ liquid-liquid extraction
Trihalomethanes	EPA 501	GC/ECD, micro extraction
Volatile Organics	EPA 502.2	GC/PID/Hall, purge & trap
Trichloroethylene (TCE)	EPA 502.2/524.2}	GC/PID/Hall, purge & trap
Tetrachloroethylene (PCE)	EPA 502.2/524.2}	or GC/MS, purge & trap
TCE & PCE	EPA 502.2/524.2}	
Dibromochloropropane (DBCP)	EPA 504	GC/ECD, micro extraction
Ethylene dibromide (EDB)	EPA 504	"
EDB & DBCP	EPA 504	"
Chlorinated Pesticides Alachlor, Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Lindane, Methoxychlor, PCB's, Toxaphene	EPA 505	"
Nitrogen/phosphorus Pesticides Atrazine, Bromacil, Diazinon, Dimethoate Molinate, Prometryn, Simazine, Thiobencarb	EPA 507	GC/NPD, liquid-liquid extraction
Chlorothalonil	EPA 508	GC/ECD, liquid-liquid extraction
Herbicides Bentazon, 2,4-D, 2,4,5-TP (Silvex)	EPA 515.1	"
Volatile Organics	EPA 524.2	GC/MS, purge & trap
Diethylhexylphthalate	EPA 525	GC/MS, liquid-liquid extraction
Carbamates Aldicarb Sulfone, Aldicarb Sulfoxide, Oxamyl, Methomyl, 3-Hydroxycarbofuran, Aldicarb, Propoxur, Carbofuran, Carbaryl, 1-Naphthol, Methiocarb	EPA 531	HPLC, post column derivatization
Glyphosate (Roundup)	EPA 547	HPLC, post column derivatization
Bacteriological Analyses		
Total Coliform - 5 tube procedure	SM 908A	Fermentation, MPN
Total Coliform - 10 tube procedure	SM 908A	"
Total & Fecal Coliform - 5 tube procedure	SM 908C	"
Total & Fecal Coliform - 10 tube procedure	SM 908C	"
Standard Plate Count	SM 908A	Incubation, visual count
Total Coliform-Colilert (24 hour turn-around)	MMO-MUG	Fermentation, MPN

Table IV-1

DRINKING WATER METHODS (cont'd.)

Parameter		Method	Description
General Inorganic Chemistry			
Acidity		EPA 305.1	Titration
Alkalinity	($CaCO_3$)	EPA 310.1	Titration
Ammonia	(NH_3)		
By colorimetric		EPA 350.1	Colorimetric
By distillation (low level)		EPA 350.2	Dist./Colorimetric
Bicarbonate	(HCO_3)	EPA 310.1	Colorimetric
Biochemical Oxygen Demand	(BOD5)	EPA 405.1	ISE
Bromide	(Br)	SM 405	Colorimetric
Carbonate	(CO_3)	EPA 310.1	Titration
Carbon Dioxide	(CO_2)	SM 406	Titration
Chemical Oxygen Demand	(COD)	EPA 410.2	Colorimetric
Chloride	(Cl)	EPA 325.3	Titration
Chlorine Residual	(Cl_2)	SM 407C	Titration
Chlorine Demand		SM 409A	Titration
Color		EPA 110.3	Visual
Cyanide, Total	(CN)	EPA 335.2	Colorimetric
Electrical Conductivity	(EC)	EPA 120.1	Conductivity Bridge
Fluoride	(F)		
By electrode		EPA 340.2	ISE
By distillation		EPA 340.1	Distillation/ISE
Hardness, total	($CaCO_3$)	EPA 130.2	Titration
Hydroxide	(OH)	EPA 310.1	Titration
Langelier Index (corrosivity)		SM 203	
(langelier index calc. only)		Calc.	
MBAS		EPA 425.1	Colorimetric
Nitrogen			
Ammonia	(NH_3)	EPA 350.1	Colorimetric
Nitrate	(NO_3)	EPA 353.2	Colorimetric
Nitrite	(NO_2)	EPA 353.2	Colorimetric
Organic	(TKN - NH_3)	Calc.	
Total	(TKN + NO_3 + NO_2)	Calc.	
Total Kjeldahl Nitrogen		EPA 351.2	Colorimetric
Odor		EPA 140.1	
Oil and Grease		EPA 413.1	Gravimetric
Oxygen, Dissolved	(DO)	EPA 360.1	ISE
Phenols		EPA 420.1	Colorimetric
Phosphorus			
Ortho	(PO_4-P)	EPA 365.2	Colorimetric
Dissolved-ortho	(PO_4-P)	EPA 365.2	Colorimetric
Total	(P)	EPA 365.4	Colorimetric
Total-dissolved	(P)	EPA 365.4	Colorimetric
pH		EPA 150.1	ISE
Resistivity		--	
Sodium Percent		Calc.	
Sodium Absorption Ratio	(SAR)	EPA 200.7	ICP
(SAR calculation only)		Calc.	

Table IV-1

DRINKING WATER METHODS (cont'd.)

Parameter		Method	Description
General Inorganic Chemistry continued			
Solids/Residue			
Filterable	(TDS)	EPA 160.1	Gravimetric
Non-filterable	(Suspended)	EPA 160.2	Gravimetric
Total		EPA 160.3	Gravimetric
Volatile		EPA 160.4	Gravimetric
Settleable		EPA 160.5	Gravimetric
Sulfate	(SO4)	EPA 375.4	Turbidimetric
Sulfide	(H2S)		
Total		EPA 376.1	Methylene Blue
Dissolved		EPA 376.1	Methylene Blue
Tannin & Lignin		SM 513	Colorimetric
Titration - pH adjustment		Calc.	
Turbidity		EPA 180.1	Nephelometric
Trace Metals			
Aluminum	(Al)	EPA 202.2	Flame/Furnace Atomic Absorption
Antimony	(Sb)	EPA 204.2	"
Arsenic	(As)	EPA 206.2	"
Barium	(Ba)	EPA 200.7	ICP
Beryllium	(Be)	EPA 200.7	ICP
Boron	(B)	EPA 200.7	ICP
Cadmium	(Cd)	EPA 213.2	Flame/Furance Atomic Absorption
Calcium	(Ca)	EPA 200.7	ICP
Chromium	(Cr)	EPA 218.2	Flame/Furnace Atomic Absorption
Cobalt	(Co)	EPA 200.7	ICP
Copper	(Cu)	EPA 200.7	ICP
Iron	(Fe)	EPA 200.7	ICP
Lead	(Pb)	EPA 239.2	Flame/Furnace Atomic Absorption
Lithium	(Li)	SM 303A	"
Magnesium	(Mg)	EPA 200.7	ICP
Manganese	(Mn)	EPA 200.7	ICP
Mercury	(Hg)	EPA 245.1	Flame/Furnace Atomic Absorption
Molybdenum	(Mo)	EPA 200.7	ICP
Nickel	(Ni)	EPA 249.1	Flame/Furnace Atomic Absorption
Potassium	(K)	EPA 200.7	ICP
Selenium	(Se)	EPA 270.2	Flame/Furnace Atomic Absorption
Silica	(SiO2)	EPA 200.7	ICP
Silver	(Ag)	EPA 272.2	Flame/Furnace Atomic Absorption
Sodium	(Na)	EPA 200.7	ICP
Thallium	(Tl)	EPA 279.2	Flame/Furnace Atomic Absorption
Tin	(Sn)	EPA 282.2	"
Vanadium	(V)	EPA 200.7	ICP
Zinc	(Zn)	EPA 200.7	ICP

Table IV-1

DRINKING WATER METHODS (cont'd.)

Parameter	Method	Description
Radio Chemical Analyses		
Gross Alpha	EPA 900.0	Proportional Counter
Gross Beta	EPA 900.0	"
Gross Alpha & Beta	EPA 900.0	"
Total Radium*	EPA 900.1	Isolation, Proportional Counter
Uranium	EPA 908.0	Distillation, Liquid Scintillation
Tritium	EPA 906.0	Distillation, Liquid Scintillation
Radon	EPA 913.0	Liquid Scintillation

* Can be reported as Radium 226 if less than 3 pCi/liter.

Table IV-2

WASTEWATER AND GROUNDWATER METHODS

Parameter	Method	Description
Priority Pollutant Analyses		
Chlorinated Pesticides & PCB's	EPA 608/8080	GC/ECD,liquid-liquid or Soxhlet extr.
GC/MS Method for Volatile Organics	EPA 624/8240	GC/MS,purge & trap
GC/MS Base/Neutral & Acids	EPA 625/8270	GC/MS,liquid-liquid or Soxhlet extr.
Metals		
Sample preparation	EPA 3020	Digest
Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium & Zinc	EPA 6010/ 7000's	ICP Flame/Furnace Atompic Absorption
Cyanide	EPA 335.2	Colorimetric
Phenols	EPA 420.1	Colorimetric
Organic Chemical Analyses		
Purgeable Halocarbons	EPA 601/8010	GC/PID/Hall, purge & trap
Non-Halogenated Volatile Organics	EPA 8015 M	GC/FID purge & trap
Aromatic Volatile Organics	EPA 602/8020	"
Purgeable Halocarbons &	EPA 601/8010	GC/PID/Hall, purge & trap
Aromatic Volatile Organics	EPA 602/8020	GC/PID,purge & trap
Phenols	EPA 604/8040	
Chlorinated Pesticides & PCB's	EPA 608/8080	GC/ECD liquid-liquid or Soxhlet extr.
Chlorinated Pesticides	EPA 608/8080	"
PCB's	EPA 608/8080	"
Polynuclear Aromatic Hydrocarbons	EPA 610/8100	
Organophosphorus Pesticides	EPA 614/8140	GC/FPD liquid-liquid or Soxhlet extr.
Chlorinated Herbicides	EPA 615/8150	GC/ECD liquid-liquid or Soxhlet extr.
Triazine Pesticides	EPA 619	GC/NPD liquid-liquid
GC/MS Method for Volatile Organics	EPA 624/8240	GC/MS purge & trap
GC/MS Base/Neutral & Acids	EPA 625/8270	GC/MS liquid-liquid or Soxhlet extr.
Base/Neutral fraction	EPA 625/8270	"
Acid fraction	EPA 625/8270	"
Carbamates	EPA 632	HPLC/UV liquid-liquid
Total Organic Halogens (TOX)	EPA 9020	Coulometric, Pyrolysis
Total Organic Carbon (TOC)	EPA 9060	Combustion, IR
Trichloroethylene (TCE)	EPA 601*/624**	*GC/PID/Hall purge & trap
Tetrachloroethylene (PCE)	EPA 601/624	**GC/MS purge & trap
TCE & PCE	EPA 601/624	"

Table IV-2

WASTEWATER AND GROUNDWATER METHODS (cont'd.)

Parameter	Method	Description
Bacteriological Analyses		
Total Coliform - 15 tube procedure	SM 908A	Fermentation, MPN
Total & Fecal Coliform - 15 tube procedure	SM 908C	Fermentation, MPN
Standard Plate Count	SM 907A	Incubation, visual count
Radio Chemical Analyses		
Gross Alpha	EPA 900.0	Proportional counter
Gross Beta	EPA 900.0	Proportional counter
Gross Alpha & Beta	EPA 900.0	Proportional counter
Total Radium*	EPA 900.1	Isolation, proportional counter
Uranium	EPA 908.0	Isolation, proportional counter
Tritium	EPA 906.0	Distillation, liquid scintillation
Radon	EPA 913.0	Liquid scintillation

* Can be reported as Radium 226 if less than 3 pCi/liter.

Table IV-2

WASTEWATER AND GROUNDWATER METHODS (cont'd.)

Parameter		Method	Description
General Inorganic Chemistry			
Acidity		EPA 305.1	Titration
Alkalinity	(CaCO3)	EPA 310.1	Titration
Ammonia	(NH3)		
By colorimetric		EPA 350.1	Colorimetric
By distillation (low level)		EPA 350.2	Dist./Colorimetric
Bicarbonate	(HCO3)	EPA 310.1	Colorimetric
Biochemical Oxygen Demand	(BOD5)	EPA 405.1	ISE
Bromide	(Br)	SM 405	Colorimetric
Carbonate	(CO3)	EPA 310.1	Titration
Carbon Dioxide	(CO2)	SM 406	Titration
Chemical Oxygen Demand	(COD)	EPA 410.2	Colorimetric
Chloride	(Cl)	EPA 325.3	Titration
Chlorine Residual	(Cl2)	SM 407C	Titration
Chlorine Demand		SM 409A	Titration
Color		EPA 110.3	Visual
Cyanide, Total	(CN)	EPA 335.2	Colorimetric
Electrical Conductivity	(EC)	EPA 120.1	Conductivity Bridge
Fluoride	(F)		
By electrode		EPA 340.2	ISE
By distillation		EPA 340.1	Distillation/ISE
Hardness, total	(CaCO3)	EPA 130.2	Titration
Hydroxide	(OH)	EPA 310.1	Titration
Langelier Index (corrosivity)		SM 203	
(langelier index calc. only)		Calc.	
MBAS		EPA 425.1	Colorimetric
Nitrogen			
Ammonia	(NH3)	EPA 350.1	Colorimetric
Nitrate	(NO3)	EPA 353.2	Colorimetric
Nitrite	(NO2)	EPA 353.2	Colorimetric
Organic	(TKN - NH3)	Calc.	
Total	(TKN + NO3 + NO2)	Calc.	
Total Kjeldahl Nitrogen		EPA 351.2	Colorimetric
Odor		EPA 140.1	
Oil and Grease		EPA 413.1	Gravimetric
Oxygen, Dissolved	(DO)	EPA 360.1	ISE
Phenols		EPA 420.1	Colorimetric
Phosphorus			
Ortho	(PO4-P)	EPA 365.2	Colorimetric
Dissolved-ortho	(PO4-P)	EPA 365.2	Colorimetric
Total	(P)	EPA 365.4	Colorimetric
Total-dissolved	(P)	EPA 365.4	Colorimetric
pH		EPA 150.1	ISE
Resistivity		--	
Sodium Percent		Calc.	
Sodium Absorption Ratio	(SAR)	EPA 200.7	ICP
(SAR calculation only)		Calc.	

Table IV-2

WASTEWATER AND GROUNDWATER METHODS (cont'd.)

Parameter		Method	Description
General Inorganic Chemistry continued			
Solids/Residue			
Filterable	(TDS)	EPA 160.1	Gravimetric
Non-filterable	(Suspended)	EPA 160.2	Gravimetric
Total		EPA 160.3	Gravimetric
Volatile		EPA 160.4	Gravimetric
Settleable		EPA 160.5	Gravimetric
Sulfate	(SO4)	EPA 375.4	Turbidimetric
Sulfide	(H2S)		
Total		EPA 376.1	Methylene Blue
Dissolved		EPA 376.1	Methylene Blue
Tannin & Lignin		SM 513	Colorimetric
Titration - pH adjustment		Calc.	
Turbidity		EPA 180.1	Nephelometric
Trace Metals			
Sample preparation for metals analysis		EPA 3005/3020	Digestion
Aluminum	(Al)	EPA 7020	Flame/Furnace Atomic Absorption
Antimony	(Sb)	EPA 7041	"
Arsenic	(As)	EPA 7060	"
Barium	(Ba)	EPA 6010	ICP
Beryllium	(Be)	EPA 6010	"
Boron	(B)	EPA 6010	"
Cadmium	(Cd)	EPA 7131	Flame/Furnace Atomic Absorption
Calcium	(Ca)	EPA 6010	ICP
Chromium	(Cr)	EPA 7191	Flame/Furnace Atomic Absorption
Chromium VI	(Cr+6)	EPA 7196	
Cobalt	(Co)	EPA 6010	ICP
Copper	(Cu)	EPA 6010	"
Gold	(Au)	EPA 231.1	Flame/Furnace Atomic Absorption
Iron	(Fe)	EPA 6010	ICP
Lead	(Pb)	EPA 7421	Flame/Furnace Atomic Absorption
Lithium	(Li)	SM 7430	"
Magnesium	(Mg)	EPA 7450	"
Manganese	(Mn)	EPA 7460	"
Mercury	(Hg)	EPA 7470	Cold Vapor Atomic Absorption
Molybdenum	(Mo)	EPA 6010	ICP
Nickel	(Ni)	EPA 7520	Flame/Furnace Atomic Absorption
Potassium	(K)	EPA 7610	"
Selenium	(Se)	EPA 7741	"
Silica	(SiO2)	EPA 6010	ICP
Silver	(Ag)	EPA 7761	Flame/Furnace Atomic Absorption
Sodium	(Na)	EPA 7770	"
Thallium	(Tl)	EPA 7841	"
Tin	(Sn)	EPA 7870	"
Vanadium	(V)	EPA 6010	ICP
Zinc	(Zn)	EPA 6010	ICP

Table IV-3

HAZARDOUS WASTE METHODS

Parameter	Method	Description
California Assessment Manual (CAM-TTLC)	Title 22	
Metals analyses		
Sample preparation	EPA 3050	Digestion
Sb,As,Se	EPA 7000's	Flame/Furnace Atomic Absorption
Ba,Be,Cd,Cr,Co,Cu,Pb,Mo,Ni,Ag,Tl,V,Zn	EPA 6010/ 7000's	ICP Flame/Furnace Atomic Absorption
Hg	EPA 7470	Cold Vapor Atomic Absorption
Chromium VI (Cr+6)	EPA 7196	Colorimetric
Fluoride (distillation)	EPA 340.1	Distillation, ISE
Organic analyses		
2,4-D & 2,4,5-TP (Silvex)	EPA 8150	GC/ECE, Soxhlet Extraction
PCP	EPA 8150	"
TCE	EPA 8010	GC/PID/Hall, purge & trap
Aldrin, BHC, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Endosulfan, Heptachlor, Lindane, Methoxychlor, PCB's, Toxaphene	EPA 8080	GC/ECD, Soxhlet Extraction
Waste Extraction Test (WET-STLC)	Title 22	
Sample Preparation (citrate buffer extraction)		
Metals analyses		
Sb,As,Se	EPA 7000's	Flame/Furnace Atomic Absorption
Ba,Be,Cd,Cr,Co,Cu,Pb,Mo,Ni,Ag,Tl,V,Zn	EPA 6010/ 7000's	ICP Flame/Furnace Atomic Absorption
Hg	EPA 7471	"
Chromium VI (Cr+6)	EPA 7196	Colorimetric
Fluoride (distillation)	EPA 340.1	Distillation/ISE
Organic analyses		
2,4-D & 2,4,5-TP (Silvex)	EPA 8150	GC/ECE, Soxhlet Extraction
PCP	EPA 8150	"
TCE	EPA 8010	GC/PID/Hall, purge & trap 's
Aldrin, BHC, Chlordane, DDD, DDE, DDT, Dieldrin, Endrin, Endosulfan, Heptachlor, Lindane, Methoxychlor, PCB, Toxaphene	EPA 8080	GC/ECD, Soxhlet Extraction

Table IV-3

HAZARDOUS WASTE METHODS (cont'd.)

Parameter	Method	Description
TCLP (Toxicity Characteristic Leaching Procedure)	RCRA	
Extraction		
ZHE (Zero Headspace Extraction) TCLP Extraction for all non-volatiles	EPA 1311	
Metals		
Sample preparation	EPA 3020	Digestion
Arsenic, Barium, Cadmium, Chromium, Lead Mercury, Selenium & Silver	EPA 6010/ 7000's	ICP Flame/Furnace Atomic Absorption
Organic Analyses		
Volatiles from ZHE	EPA 8240	GC/MS, purge & trap
Base-Neutral & Acids	EPA 8270	GC/MS, Soxhlet Extraction
Herbicides	EPA 8150	GC/ECD, Soxhlet Extraction
Pesticides	EPA 8080	GC/ECD, Soxhlet Extraction
EP Toxicity	RCRA	
Extraction	EPA 1310	
Metals		
Arsenic, Barium, Cadmium, Chromium, Lead Mercury, Selenium & Silver	EPA 6010/ 7000's	ICP Flame/Furnace Atomic Absorption
Organic Analyses		
Herbicides	EPA 8150	GC/ECD, Soxhlet Extraction
Pesticides	EPA 8080	GC/ECD, Soxhlet Extraction
ICAP Scan		
Aluminum, Antimony, Arsenic, Boron, Cadmium, Barium, Beryllium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Sodium, Thallium, Vanadium, Zinc	EPA 6010/ 7000's	ICP Flame/Furnace Atomic Absorption

Table IV-3

HAZARDOUS WASTE METHODS (cont'd.)

Parameter		Method	Description
Underground Storage Tank Analysis			
Total Petroleum Hydrocarbons	(TPH)	EPA 8015M	GC/FID, purge & trap
Total Petroleum Hydrocarbons (I.R. Spectroscopy)	(TPH)	EPA 418.1	IR, liquid-liquid
Benzene, Toluene, Ethylbenzene, Xylene	(BTEX)	EPA 8020	GC/PID, purge & trap
TPH and BTEX		EPA 8015M/ 8020	GC/FID, purge & trap
Ethylene Dibromide and Ethylene Dichloride	(EDB) (EDC)	EPA 8010	GC/PID/Hall, purge & trap
Total Lead		EPA 7420	Flame/Furnace Atomic Absorption
Soluble Lead		EPA 7420	Flame/Furnace Atomic Absorption
Organic Chemical Analysis			
Purgeable Halocarbons		EPA 8010	GC/PID/Hall, purge & trap
Non-Halogenated Volatile Organics		EPA 8015 M	GC/FID purge & trap
Aromatic Volatile Organics		EPA 8020	"
Purgeable Halocarbons & Aromatic Volatile Organics		EPA 8010 & 8020	GC/PID/Hall, purge & trap GC/PID, purge & trap
Phenols		EPA 8040	
Chlorinated Pesticides & PCB's		EPA 8080	GC/ECD, liquid-liquid
Chlorinated Pesticides		EPA 8080	GC/ECD, liquid-liquid or Soxhlet extr.
PCB's		EPA 8080	"
Polynuclear Aromatic Hydrocarbons		EPA 8100	
Organophosphorus Pesticides		EPA 8140	GC/FPD, liquid-liquid or Soxhlet extr.
Chlorinated Phenoxy Herbicides		EPA 8150	GC/ECE, liquid-liquid or Soxhlet extr.
Triazine Pesticides		EPA 619	GC/NPD, liquid-liquid
GC/MS Method for Volatile Organics		EPA 8240	
GC/MS Base/Neutral & Acids		EPA 8270	GC/MS, liquid-liquid or Soxhlet extr.
Base/Neutral fraction		EPA 8270	"
Acid fraction		EPA 8270	"
Carbamates		EPA 632	HPLC/UV, liquid-liquid
Total Organic Halogens	(TOX)	EPA 9020	Coulometric, Pyrolysis
Total Organic Carbon	(TOC)	EPA 9060	Combustion, IR
Total Organic Carbon	(TOC)	EPA 415.1	
Trichloroethylene	(TCE)	EPA 8010/8240	GC/MS, purge & trap
Tetrachloroethylene	(PCE)	EPA 8010/8240	"
TCE & PCE		EPA 8010/8240	"

Table IV-3

HAZARDOUS WASTE METHODS (cont'd.)

Parameter	Method	Description
Hazardous Waste Characterization	RCRA/Title 22	
Corrosivity		
Aqueous sample (pH)	EPA 9040	ISE
Nonaqueous sample (1:1 DI water pH)	EPA 9045	ISE
Ignitability		
Aqueous (Flashpoint)	EPA 1010	Flashpoint
Nonaqueous (Flammability)	EPA 1020	Flashpoint
Reactivity		Observation
Reaction with water		
Reaction with dilute acid		
Reaction with dilute base		
Reaction with oxidizing agent		
Reaction with reducing agent		
Sulfide generation		
Cyanide generation		
Toxicity Bioassay	Title 22	
Calif. Acute Toxicity - 96 Hr. % Survival		
Screen - 2 conc. + control - 20 fish/conc.		
Definitive - 5 conc. + control - 20 fish/conc.		

Table IV-4

SLUDGE METHODS

Parameter		Method	Description
General Inorganic Chemistry			
Cyanide, total	(CN)	EPA 335.2	Distillation/Colorimetric
Fluoride	(F)	EPA 340.1	Distillation/Colorimetric
Moisture		ASA/UL	Gravimetric
Nitrogen			
Ammonia	(NH3)	EPA 350.1	Colorimetric
Nitrate	(NO3)	EPA 353.2	Colorimetric
Total	(TKN+NO3+NO2)	EPA 351.1	Colorimetric
Oil and grease			
Separatory funnel		EPA 413.1	Gravimetric
Soxhlet		EPA 413.2	IR
pH		EPA 9045	ISE
Phosphorus, Total	(P)	EPA 365.4	Colorimetric
Sulfide	(H2S)	EPA 376.1	Colorimetric
Trace Metals			
Sample preparation for metals analysis		EPA 3050	Digestion
Aluminum	(Al)	EPA 6010	ICP
Antimony	(Sb)	EPA 7041	Furnace/Flame Atomic Absorption
Arsenic	(As)	EPA 7060	Furnace/Flame Atomic Absorption
Barium	(Ba)	EPA 6010	ICP
Beryllium	(Be)	EPA 6010	"
Boron	(B)	EPA 6010	"
Cadmium	(Cd)	EPA 6010	"
Chromium	(Cr)	EPA 6010	"
Chromium VI	(Cr+6)	EPA 7196	Furnace/Flame Atomic Absorption
Cobalt	(Co)	EPA 6010	ICP
Copper	(Cu)	EPA 6010	"
Lead	(Pb)	EPA 7420	Furnace/Flame Atomic Absorption
Mercury	(Hg)	EPA 7470	"
Molybdenum	(Mo)	EPA 6010	ICP
Nickel	(Ni)	EPA 6010	"
Selenium	(Se)	EPA 7741	Furnace/Flame Atomic Absorption
Silver	(Ag)	EPA 7760	"
Thallium	(Tl)	EPA 7841	"
Vanadium	(V)	EPA 6010	ICP
Zinc	(Zn)	EPA 6010	"

V. Quality Assurance Objectives

The quality assurance plan for laboratory operations has two main objectives. Primarily, it supplies a mechanism for continual control and assessment of data quality. Secondly, historical quality control data may be used to define data quality in terms of accuracy and precision.

The quality control objectives for accuracy, precision, and Method Detection Limit (MDL) are listed in Tables V-1 to V-3. Accuracy values are expressed as a percentage of a true value, and serve as a reflection of the total measurement error (random and systematic). Accuracy is usually measured by determination of the percent recovery of known target analyte addition to a given sample or representative sample matrix.

Precision values are expressed as relative percent difference (RPD) between two duplicate measurements, and serve as a reflection of the variability in measurement replication.

The Method Detection Limit (MDL) reflects the minimum concentration of a given analyte in a given matrix that can be determined and reported with 99 percent confidence that the analyte concentration is above zero. Detection limit studies are conducted annually to ensure that the objectives listed in this section are met or exceeded.

Table V-4 and V-5 list key ions and ion abundance for the calibration criteria compounds (BFB and DFTPP, respectively) used in GC-MASS Spectrometry methods.

FGL uses the following equations for quality control calculations:

$$\% \text{ Recovery} = \frac{\text{Actual Value}}{\text{Theoretical Value}} \text{ X } 100$$

The relative percent difference (RPD) in duplicate samples is calculated by:

$$\text{RPD} = \frac{(\text{ Value(1)} - \text{Value(2) }) \text{ x } 100\%}{(\text{Value(1)} + \text{Value(2)})/2}$$

and sample standard deviation (when applicable) may be calculated by:

$$\left[\frac{\sum_{i=1}^{i=n} (X_i - \bar{X})^2}{n - 1} \right]^{1/2}$$

Where: X_i = The i^{th} sample observation

$\bar{X}$ = The sample average

n = The total number of sample observations

For general mineral analysis, the anion and cation balances should be determined. If the difference is more than 0.3 meq/L or 5 percent (whichever is greater), the analysis should be rechecked.

For GC/MS analyses, the overall precision and accuracy of recovery is monitored by the addition of internal standards to every sample.

FGL Analytical Review Policy

Chemists/analysts will review each others data on an ongoing basis and note the review of data by dating and initialling the work or section reviewed in the analyst's notebook. This internal checking of data by the chemist will be confirmed by the QA/QC Director. All work completed by a technician is checked by the technician's supervisor before publishing.

Analytical results are recorded in the FGL Laboratory Information Management System (LIMS) to show the date on which the data was obtained and the analyst responsible for the data. Precision and accuracy (duplicates and spikes) data is also recorded by the analyst into the FGL LIMS system. The acceptance limits are stored in the LIMS system as well. The LIMS system required that the data meet the acceptance criteria and be checked by a second analyst prior to release for reporting. If matrix interference is the cause for data being out of acceptance limits, the LIMS system will also require that a supervisor release the data with a comment explaining the reason for the out of control data. System security is achieved by the use of personalized passwords and restricted electronic access according to personal responsibilities.

TABLE V-1

QUALITY CONTROL ACCEPTANCE CRITERIA
for
ORGANIC METHODS

Method EPA 501

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Bromodichloromethane	70-130	20.0	0.050	ug/L
Bromoform	70-130	20.0	0.050	ug/L
Chloroform	70-130	20.0	0.050	ug/L
Dibromochlormethane	70-130	20.0	0.050	ug/L

Method EPA 502.2

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Benzene	37-151	30.0	0.050	ug/L
Bromobenzene	50-150	30.0	0.050	ug/L
Bromochloromethane	50-150	30.0	0.050	ug/L
Bromodichloromethane	35-155	30.0	0.050	ug/L
Bromoform	45-169	30.0	0.050	ug/L
Bromomethane	D-242	30.0	0.050	ug/L
n-Butylbenzene	50-150	30.0	0.050	ug/L
sec-Butylbenzene	50-150	30.0	0.050	ug/L
tert-Butylbenzene	50-150	30.0	0.050	ug/L
Carbon Tetrachloride	70-140	30.0	0.050	ug/L
Chlorobenzene	37-160	30.0	0.050	ug/L
Chloroethane	14-230	30.0	0.050	ug/L
Chloroform	51-138	30.0	0.050	ug/L
Chloromethane	D-273	30.0	0.050	ug/L
2-Chlorotoluene	50-150	30.0	0.050	ug/L
4-Chlorotoluene	50-150	30.0	0.050	ug/L
DBCP	50-150	30.0	0.050	ug/L
Dibromochlormethane	53-149	30.0	0.050	ug/L
1,2-Dibromoethane	50-150	30.0	0.050	ug/L
Dibromomethane	50-150	30.0	0.050	ug/L
1,2-Dichlorobenzene	50-150	30.0	0.050	ug/L
1,3-Dichlorobenzene	50-150	30.0	0.050	ug/L
1,4-Dichlorobenzene	50-150	30.0	0.050	ug/L
Dichlorodifluoromethane	50-150	30.0	0.050	ug/L
1,1-Dichloroethane	59-155	30.0	0.050	ug/L
1,2-Dichloroethane	49-155	30.0	0.050	ug/L
1,1-Dichloroethylene	D-234	30.0	0.050	ug/L
cis-1,2-Dichloroethylene	50-150	30.0	0.050	ug/L
trans-1,2-Dichloroethylene	54-156	30.0	0.050	ug/L
1,2-Dichloropropane	D-210	30.0	0.050	ug/L
1,3-Dichloropropane	50-150	30.0	0.050	ug/L
2,2-Dichloropropane	50-150	30.0	0.050	ug/L
1,1-Dichloropropene	50-150	30.0	0.050	ug/L
cis-1,3-Dichloropropene	D-227	30.0	0.050	ug/L
trans-1,3-Dichloropropene	17-183	30.0	0.050	ug/L
Ethyl Benzene	37-162	30.0	0.050	ug/L

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 502.2

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Hexachlorobutadiene	50-150	30.0	0.050 ug/L
Isopropylbenzene	50-150	30.0	0.050 ug/L
p-Isopropyltoluene	50-150	30.0	0.050 ug/L
Methylene Chloride	D-221	30.0	0.050 ug/L
Naphthalene	50-150	30.0	0.050 ug/L
n-Propylbenzene	50-150	30.0	0.050 ug/L
Styrene	50-150	30.0	0.050 ug/L
1,1,1,2-Tetrachlorethane	50-150	30.0	0.050 ug/L
1,1,2,2-Tetrachloroethane	46-157	30.0	0.050 ug/L
Tetrachloroethylene	64-148	30.0	0.050 ug/L
Toluene	47-163	30.0	0.050 ug/L
1,2,3-Trichlorobenzene	50-150	30.0	0.050 ug/L
1,2,4-Trichlorobenzene	50-150	30.0	0.050 ug/L
1,1,1-Trichloroethane	52-162	30.0	0.050 ug/L
1,1,2-Trichloroethane	52-150	30.0	0.050 ug/L
Trichlorethylene	71-157	30.0	0.050 ug/L
Trichlorofluoromethane	17-181	30.0	0.050 ug/L
1,2,3-Trichloropropane	50-150	30.0	0.050 ug/L
1,1,2-Trichlorotrifluoroethane	50-150	30.0	0.050 ug/L
1,2,4-Trimethylbenzene	50-150	30.0	0.050 ug/L
1,3,5-Trimethylbenzene	50-150	30.0	0.050 ug/L
Vinyl Chloride	D-251	30.0	0.050 ug/L
Xylenes m,p	50-150	30.0	0.050 ug/L
Xylenes o	50-150	30.0	0.050 ug/L

Method EPA 504

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
DBCP	70-130	30.0	0.001 ug/L
EDB	70-130	30.0	0.002 ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 505

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Alachlor	50-150	30.0	0.040 ug/L
Aldrin	42-122	30.0	0.005 ug/L
Chlordane	45-119	30.0	0.005 ug/L
Dieldrin	36-146	30.0	0.005 ug/L
Endrin	30-147	30.0	0.005 ug/L
Heptachlor	34-111	30.0	0.005 ug/L
Heptachlor Epoxide	37-142	30.0	0.005 ug/L
Hexachlorobenzene	50-150	30.0	0.005 ug/L
Lindane	32-127	30.0	0.005 ug/L
Methoxychlor	50-150	30.0	0.005 ug/L
Toxaphene	41-126	30.0	0.100 ug/L
PCB 1016	50-114	30.0	0.050 ug/L
PCB 1221	15-178	30.0	0.050 ug/L
PCB 1232	10-215	30.0	0.050 ug/L
PCB 1242	39-150	30.0	0.050 ug/L
PCB 1248	38-158	30.0	0.050 ug/L
PCB 1254	29-131	30.0	0.050 ug/L
PCB 1260	8-127	30.0	0.050 ug/L

Method EPA 507

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
1,3-Dimethyl-2-nitrobezene	50-150	30.0	0.000 ug/L
9-Nitroanthracene	50-150	30.0	0.000 ug/L
Atrazine	70-130	30.0	0.100 ug/L
Simazine	70-130	30.0	0.100 ug/L
Molinate	70-130	30.0	0.200 ug/L
Thiobencarb	70-130	30.0	0.100 ug/L
Bromocil	70-130	30.0	0.500 ug/L
Diazinon	70-130	30.0	0.200 ug/L
Prometryne	70-130	30.0	0.200 ug/L
Dimethoate	70-130	30.0	0.200 ug/L

Method EPA 508

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Hexachlorobenzene	70-130	30.0	0.000 ug/L
Chlorothalonil	70-130	30.0	0.020 ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
for
ORGANIC METHODS

Method EPA 515.1

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
2,4,5-T	30-150	30.0	0.100 ug/L
2,4-D	30-150	30.0	1.000 ug/L
2,4,5-TP (Silvex)	30-150	30.0	0.100 ug/L
Bentazon	30-150	30.0	0.200 ug/L
Dalapon	30-150	30.0	0.100 ug/L
Dinoseb	30-150	30.0	0.100 ug/L
Pichloram	30-150	30.0	0.100 ug/L

Method EPA 524.2

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
1,2-Dichloroethane-d4	76-114	30.0	0.000 ug/L
Toluene-d8	88-110	30.0	0.000 ug/L
BFB	86-115	30.0	0.000 ug/L
Benzene	37-151	30.0	0.050 ug/L
Bromobenzene	50-150	30.0	0.050 ug/L
Bromochloromethane	50-150	30.0	0.050 ug/L
Bromodichloromethane	35-155	30.0	0.050 ug/L
Bromoform	45-169	30.0	0.050 ug/L
Bromomethane	D-242	30.0	0.050 ug/L
n-Butylbenzene	50-150	30.0	0.050 ug/L
sec-Butylbenzene	50-150	30.0	0.050 ug/L
tert-Butylbenzene	50-150	30.0	0.050 ug/L
Carbon Tetrachloride	70-140	30.0	0.050 ug/L
Chlorobenzene	37-160	30.0	0.050 ug/L
Chloroethane	14-230	30.0	0.050 ug/L
Chloroform	51-138	30.0	0.050 ug/L
Chloromethane	D-273	30.0	0.050 ug/L
2-Chlorotoluene	50-150	30.0	0.050 ug/L
4-Chlorotoluene	50-150	30.0	0.050 ug/L
Dibromochlormethane	53-149	30.0	0.050 ug/L
Dibromomethane	50-150	30.0	0.050 ug/L
1,2-Dichlorobenzene	50-150	30.0	0.050 ug/L
1,3-Dichlorobenzene	50-150	30.0	0.050 ug/L
1,4-Dichlorobenzene	50-150	30.0	0.050 ug/L
Dichlorodifluoromethane	50-150	30.0	0.050 ug/L
1,1-Dichloroethane	59-155	30.0	0.050 ug/L
1,2-Dichloroethane	49-155	30.0	0.050 ug/L
1,1-Dichloroethylene	D-234	30.0	0.050 ug/L
cis-1,2-Dichloroethylene	50-150	30.0	0.050 ug/L
trans-1,2-Dichloroethylene	54-156	30.0	0.050 ug/L

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 524

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
1,2-Dichloropropane	D-210	30.0	0.050 ug/L
1,3-Dichloropropane	50-150	30.0	0.050 ug/L
2,2-Dichloropropane	50-150	30.0	0.050 ug/L
1,1-Dichloropropene	50-150	30.0	0.050 ug/L
cis-1,3-Dichloropropene	D-227	30.0	0.050 ug/L
trans-1,3-Dichloropropene	17-183	30.0	0.050 ug/L
Ethyl Benzene	37-162	30.0	0.050 ug/L
Hexachlorobutadiene	50-150	30.0	0.050 ug/L
Isopropylbenzene	50-150	30.0	0.050 ug/L
p-Isopropyltoluene	50-150	30.0	0.050 ug/L
Methylene Chloride	D-221	30.0	0.050 ug/L
Naphthalene	50-150	30.0	0.050 ug/L
n-Propylbenzene	50-150	30.0	0.050 ug/L
Styrene	50-150	30.0	0.050 ug/L
1,1,1,2-Tetrachloroethane	50-150	30.0	0.050 ug/L
1,1,2,2-Tetrachloroethane	46-157	30.0	0.050 ug/L
Tetrachloroethylene	64-148	30.0	0.050 ug/L
Toluene	47-163	30.0	0.050 ug/L
1,2,3-Trichlorobenzene	50-150	30.0	0.050 ug/L
1,2,4-Trichlorobenzene	50-150	30.0	0.050 ug/L
1,1,1-Trichloroethane	52-162	30.0	0.050 ug/L
1,1,2-Trichloroethane	52-150	30.0	0.050 ug/L
Trichlorethylene	71-157	30.0	0.050 ug/L
Trichlorofluoromethane	17-181	30.0	0.050 ug/L
1,2,3-Trichloropropane	50-150	30.0	0.050 ug/L
1,1,2-Trichlorotrifluoroethane	50-150	30.0	0.050 ug/L
1,2,4-Trimethylbenzene	50-150	30.0	0.050 ug/L
1,3,5-Trimethylbenzene	50-150	30.0	0.050 ug/L
Vinyl Chloride	D-251	30.0	0.050 ug/L
Xylenes m,p	50-150	30.0	0.050 ug/L
Xylenes o	50-150	30.0	0.050 ug/L
Acetone	50-150	30.0	0.050 ug/L
2-Butanone (MEK)	50-150	30.0	0.050 ug/L
Carbon Disulfide	50-150	30.0	0.050 ug/L
1,2-Dibromo-3-chloropropane	50-150	30.0	0.050 ug/L
1,2-Dibromoethane (EDB)	50-150	30.0	0.050 ug/L
2-Hexanone	50-150	30.0	0.050 ug/L
4-Methyl-2-pentanone (MIBK)	50-150	30.0	0.050 ug/L
Vinyl Acetate	50-150	30.0	0.050 ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 525

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Perylene-d12	50-150	30.0	0.100 ug/L
bis(2-Ethylhexly)phthalate	29-137	30.0	0.100 ug/L

Method EPA 531

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Aldicarb Sulfone	70-130	30.0	1.000 ug/L
Aldicarb Sulfoxide	70-130	30.0	1.000 ug/L
Oxymal	70-130	30.0	1.000 ug/L
Methomyl	70-130	30.0	1.000 ug/L
3-Hydroxycarbofuran	70-130	30.0	2.000 ug/L
Aldicarb	70-130	30.0	1.000 ug/L
Propoxur	70-130	30.0	1.000 ug/L
Carbofuran	70-130	30.0	1.000 ug/L
Carbaryl	70-130	30.0	1.000 ug/L
1-Napthol	70-130	30.0	1.000 ug/L
Methiocarb	70-130	30.0	2.000 ug/L

Method EPA 547

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Glyphosate	70-130	20.0	7.000 ug/L

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 601

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Bromodichloromethane	42-172	20.0	0.050 ug/L
Bromoform	13-159	20.0	0.050 ug/L
Bromomethane	D-144	20.0	0.050 ug/L
Carbon Tetrachloride	43-143	20.0	0.050 ug/L
Chlorobenzene	38-150	20.0	0.050 ug/L
Chloroethane	46-137	20.0	0.050 ug/L
Chloroform	49-133	20.0	0.050 ug/L
Chloromethane	D-193	20.0	0.050 ug/L
Dibromochlormethane	24-191	20.0	0.050 ug/L
1,2-Dichlorobenzene	D-208	20.0	0.050 ug/L
1,3-Dichlorobenzene	7-187	20.0	0.050 ug/L
1,4-Dichlorobenzene	42-143	20.0	0.050 ug/L
Dichlorodifluoromethane	50-150	20.0	0.050 ug/L
1,1-Dichloroethane	47-132	20.0	0.050 ug/L
1,2-Dichloroethane	51-147	20.0	0.050 ug/L
1,1-Dichloroethylene	28-167	20.0	0.050 ug/L
trans-1,2-Dichloroethylene	38-155	20.0	0.050 ug/L
1,2-Dichloropropane	44-156	20.0	0.050 ug/L
cis-1,3-Dichloropropene	22-178	20.0	0.050 ug/L
trans-1,3-Dichloropropene	22-178	20.0	0.050 ug/L
Methylene Chloride	25-162	20.0	0.050 ug/L
1,1,2,2-Tetrachlorethane	50-150	20.0	0.050 ug/L
Tetrachloroethylene	26-162	20.0	0.050 ug/L
1,1,1-Trichlorethane	41-138	20.0	0.050 ug/L
1,1,2-Trichlorethane	39-139	20.0	0.050 ug/L
Trichlorethylene	35-146	20.0	0.050 ug/L
Trichlorofluoromethane	21-156	20.0	0.050 ug/L
Vinyl Chloride	28-163	20.0	0.050 ug/L

Method EPA 602

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Benzene	39-150	20.0	0.050 ug/L
Toluene	46-148	20.0	0.050 ug/L
Ortho Xylene	50-150	20.0	0.050 ug/L
Para Xylene	50-150	20.0	0.050 ug/L
Meta Xylene	50-150	20.0	0.050 ug/L
Chlorobenzene	55-135	20.0	0.050 ug/L
Ethyl Benzene	32-160	20.0	0.050 ug/L
1,2-Dichlorobenzene	37-154	20.0	0.050 ug/L
1,3-Dichlorobenzene	50-141	20.0	0.050 ug/L
1,4-Dichlorobenzene	42-143	20.0	0.050 ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 604

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
2-Chlorophenol	23-134	30.0	1.000	ug/L
2,4-Dichlorophenol	39-135	30.0	1.000	ug/L
2,4-Dimethylphenol	42-109	30.0	1.000	ug/L
4,6-Dinitro-o-cresol	D-181	30.0	5.000	ug/L
2,4-Dinitrophenol	D-191	30.0	5.000	ug/L
2-Methylphenol	50-150	30.0	1.000	ug/L
4-Methylphenol	50-150	30.0	1.000	ug/L
2-Nitrophenol	29-182	30.0	1.000	ug/L
4-Nitrophenol	29-182	30.0	5.000	ug/L
p-Chloro-m-cresol	22-147	30.0	2.000	ug/L
Pentachlorophenol	14-176	30.0	5.000	ug/L
Phenol	5-112	30.0	1.000	ug/L
2,4,5-Trichlorophenol	37-144	30.0	1.000	ug/L
2,4,6-Trichlorphenol	37-144	30.0	1.000	ug/L

Method EPA 608

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Hexachlorobenzene	50-150	30.0	0.000	ug/L
Dibutylchlorendate	24-154	30.0	0.000	ug/L
Aldrin	42-122	30.0	0.020	ug/L
Alpha BHC	37-134	30.0	0.020	ug/L
Beta BHC	17-147	30.0	0.020	ug/L
Delta BHC	19-140	30.0	0.020	ug/L
Chlordane	45-119	30.0	0.020	ug/L
o,p - DDD	31-141	30.0	0.020	ug/L
p,p - DDD	31-141	30.0	0.020	ug/L
o,p - DDE	30-145	30.0	0.020	ug/L
p,p - DDE	30-145	30.0	0.020	ug/L
o,p - DDT	25-160	30.0	0.020	ug/L
p,p - DDT	25-160	30.0	0.020	ug/L
Dieldrin	36-146	30.0	0.020	ug/L
Endosulfan I	45-153	30.0	0.020	ug/L
Endosulfan II	D-202	30.0	0.020	ug/L
Endosulfan Sulfate	26-144	30.0	0.020	ug/L
Endrin	30-147	30.0	0.020	ug/L
Endrin Aldehyde	50-150	30.0	0.020	ug/L
Heptachlor	34-111	30.0	0.020	ug/L
Heptachlor Epoxide	37-142	30.0	0.020	ug/L
Lindane	32-127	30.0	0.020	ug/L
Methoxychlor	50-150	30.0	0.500	ug/L
Toxaphene	41-126	30.0	0.500	ug/L
PCB 1016	50-114	30.0	0.200	ug/L
PCB 1221	15-178	30.0	0.200	ug/L
PCB 1232	10-215	30.0	0.200	ug/L
PCB 1242	39-150	30.0	0.200	ug/L
PCB 1248	38-158	30.0	0.200	ug/L
PCB 1254	29-131	30.0	0.200	ug/L
PCB 1260	8-127	30.0	0.200	ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 614

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
1,3-Dimethyl-2-nitrobe	50-150	30.0	0.000	ug/L
9-Nitroanthracene	50-150	30.0	0.000	ug/L
Azinphos Methyl	50-150	30.0	0.200	ug/L
Bolstar	50-150	30.0	0.200	ug/L
Chlorpyrifos	50-150	30.0	0.200	ug/L
Coumaphos	50-150	30.0	0.200	ug/L
Demeton-o,s	50-150	30.0	0.200	ug/L
Diazinon	50-150	30.0	0.200	ug/L
Dichlorvos	50-150	30.0	0.200	ug/L
Disulfoton	50-150	30.0	0.200	ug/L
Ethoprop	50-150	30.0	0.200	ug/L
Fensulfoton	50-150	30.0	0.200	ug/L
Fenthion	50-150	30.0	0.200	ug/L
Merphos	50-150	30.0	0.200	ug/L
Mevinphos	50-150	30.0	0.200	ug/L
Naled	50-150	30.0	0.200	ug/L
Parathion Methyl	50-150	30.0	0.200	ug/L
Phorate	50-150	30.0	0.200	ug/L
Ronnel	50-150	30.0	0.200	ug/L
Stirophos	50-150	30.0	0.200	ug/L
Tokuthion	50-150	30.0	0.200	ug/L
Trichlornate	50-150	30.0	0.200	ug/L

Method EPA 615

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
2,4,5-T	50-150	30.0	0.100	ug/L
2,4-D	50-150	30.0	1.000	ug/L
2,4,5-TP (Silvex)	50-150	30.0	0.100	ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
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Method EPA 624

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
1,2-Dichloroethane-d4	76-114	30.0	N/A	
Toluene-d8	88-110	30.0	N/A	
BFB	86-115	30.0	N/A	
Acetone	50-150	30.0	5.000	ug/L
Benzene	37-151	30.0	0.050	ug/L
Bromodichloromethane	35-155	30.0	0.250	ug/L
Bromoform	45-169	30.0	0.250	ug/L
Bromomethane	D-242	30.0	0.250	ug/L
Carbon Disulfide	50-150	30.0	2.500	ug/L
Carbon Tetrachloride	70-140	30.0	0.250	ug/L
Chlorobenzene	37-160	30.0	0.050	ug/L
Chloroethane	14-230	30.0	0.250	ug/L
Chloroform	51-138	30.0	0.050	ug/L
Chloromethane	D-273	30.0	0.250	ug/L
Dibromochlormethane	53-149	30.0	0.250	ug/L
1,2-Dichlorobenzene	50-150	30.0	0.250	ug/L
1,3-Dichlorobenzene	50-150	30.0	0.250	ug/L
1,4-Dichlorobenzene	50-150	30.0	0.250	ug/L
1,1-Dichloroethane	59-155	30.0	0.250	ug/L
1,2-Dichloroethane	49-155	30.0	0.250	ug/L
1,1-Dichloroethylene	D-234	30.0	0.250	ug/L
trans-1,2-Dichloroethylene	54-156	30.0	0.250	ug/L
1,2-Dichloropropane	D-210	30.0	0.250	ug/L
cis-1,3-Dichloropropene	D-227	30.0	0.250	ug/L
trans-1,3-Dichloropropene	17-183	30.0	0.250	ug/L
Ethanol	50-150	30.0	5.000	ug/L
Ethyl Benzene	37-162	30.0	0.250	ug/L
2-Hexanone	50-150	30.0	2.500	ug/L
Methylene Chloride	D-221	30.0	0.250	ug/L
2-Butanone (MEK)	50-150	30.0	5.000	ug/L
4-Methyl-2-pentanone (MIBK)	50-150	30.0	2.500	ug/L
Styrene	50-150	30.0	0.250	ug/L
1,1,2,2-Tetrachloroethane	46-157	30.0	0.250	ug/L
Tetrachloroethylene	64-148	30.0	0.250	ug/L
Toluene	47-163	30.0	0.250	ug/L
1,1,1-Trichloroethane	52-162	30.0	0.250	ug/L
1,1,2-Trichloroethane	52-150	30.0	0.250	ug/L
Trichlorethylene	71-157	30.0	0.250	ug/L
Trichlorofluoromethane	17-181	30.0	0.250	ug/L
Vinyl Acetate	50-150	30.0	5.000	ug/L
Vinyl Chloride	D-251	30.0	0.250	ug/L
Xylenes	50-150	30.0	0.250	ug/L
Acrolein	50-150	30.0	10.000	ug/L
Acrylonitrile	50-150	30.0	10.000	ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 625

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
2-Fluorobiphenyl	43-116	30.0	N/A
Nitrobenzene-d5	35-114	30.0	N/A
p-Terphenyl-d14	33-141	30.0	N/A
2-Fluorophenol	21-100	30.0	N/A
Phenol-d6	10- 94	30.0	N/A
2,4,6-Tribromophenol	10-123	30.0	N/A
Acenaphthene	47-145	30.0	1.000 ug/L
Acenaphthylene	33-145	30.0	1.000 ug/L
Aniline	50-150	30.0	5.000 ug/L
Anthracene	27-133	30.0	1.000 ug/L
Benzo(a)anthracene	33-143	30.0	1.000 ug/L
Benzo(a)pyrene	17-163	30.0	1.000 ug/L
Benzo(b)fluoranthene	24-159	30.0	1.000 ug/L
Benzo(k)fluoranthene	11-162	30.0	1.000 ug/L
Benzo(g,h,i)perylene	D-219	30.0	1.000 ug/L
Benzylalcohol	50-150	30.0	2.000 ug/L
bis(2-Chloroethoxy)methane	33-184	30.0	1.000 ug/L
bis(2-Chloroethyl)ether	12-158	30.0	1.000 ug/L
bis(2-Chloroisopropyl)ether	36-166	30.0	1.000 ug/L
bis(2-Ethylhexly)phthalate	29-137	30.0	1.000 ug/L
4-Bromophenylphenylether	65-114	30.0	1.000 ug/L
Butylbenzylphthalate	D-152	30.0	1.000 ug/L
Chloroaniline	50-150	30.0	1.000 ug/L
Chloronaphthalene	60-180	30.0	1.000 ug/L
Chlorophenylphenylether	25-158	30.0	1.000 ug/L
Chrysene	17-168	30.0	1.000 ug/L
Dibenzo(a,h)anthracene	D-227	30.0	1.000 ug/L
Dibenzofuran	50-150	30.0	1.000 ug/L
1,2-Dichlorbenzene	32-129	30.0	1.000 ug/L
1,3-Dichlorobenzene	D-172	30.0	1.000 ug/L
1,4-Dichlorobenzene	20-124	30.0	1.000 ug/L
3,3'-Dichlorbenzidine	8-213	30.0	2.000 ug/L
Diethylphthalate	D-114	30.0	1.000 ug/L
Dimethylphthalate	D-112	30.0	1.000 ug/L
Di-n-butylphthalate	1-118	30.0	1.000 ug/L
2,4-Dinitrotoluene	39-139	30.0	1.000 ug/L
2,6-Dinitrotoluene	50-158	30.0	1.000 ug/L
Di-n-octylphthalate	4-146	30.0	1.000 ug/L
Fluoranthene	26-137	30.0	1.000 ug/L
Fluorene	59-121	30.0	1.000 ug/L
Hexachlorobenzene	50-150	30.0	1.000 ug/L
Hexachlorobutadiene	24-116	30.0	1.000 ug/L
Hexachlorocyclopentadiene	50-150	30.0	1.000 ug/L
Hexachloroethane	40-113	30.0	1.000 ug/L
Indeno(1,2,3-c,d)pyrene	50-150	30.0	1.000 ug/L
Isophorone	21-196	30.0	1.000 ug/L
2-Methylnaphthalene	50-150	30.0	1.000 ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 625

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Naphthalene	21-133	30.0	1.000	ug/L
Nitrobenzene	35-180	30.0	1.000	ug/L
N-Nitrosodimethylamine	50-150	30.0	1.000	ug/L
N-Nitrosodi-N-propylamine	D-230	30.0	1.000	ug/L
N-Nitrosodiphenylamine	50-150	30.0	1.000	ug/L
2-Nitroanaline	50-150	30.0	5.000	ug/L
3-Nitroanaline	50-150	30.0	5.000	ug/L
4-Nitroanaline	50-150	30.0	5.000	ug/L
Phenanthrene	54-120	30.0	1.000	ug/L
Pyrene	52-115	30.0	1.000	ug/L
1,2,4-Trichlorbenzene	44-142	30.0	1.000	ug/L
2-Chlorophenol	23-134	30.0	1.000	ug/L
2,4-Dichlorophenol	39-135	30.0	1.000	ug/L
2,4-Dimethylphenol	42-109	30.0	1.000	ug/L
4,6-Dinitro-o-cresol	D-181	30.0	5.000	ug/L
2,4-Dinitrophenol	D-191	30.0	5.000	ug/L
2-Methylphenol	50-150	30.0	1.000	ug/L
4-Methylphenol	50-150	30.0	1.000	ug/L
2-Nitrophenol	29-182	30.0	1.000	ug/L
4-Nitrophenol	11-114	50.0	5.000	ug/L
p-Chloro-m-cresol	22-147	30.0	2.000	ug/L
Pentachlorophenol	14-176	30.0	5.000	ug/L
Phenol	5-112	30.0	1.000	ug/L
2,4,5-Trichlorphenol	50-150	30.0	1.000	ug/L
2,4,6-Trichlorphenol	37-144	30.0	1.000	ug/L
Azobenzene	50-150	30.0	5.000	ug/L
Benzidine	50-150	30.0	5.000	ug/L
Benzoic Acid	50-150	30.0	5.000	ug/L

Method EPA 8010

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Benzylchloride	50-150	20.0	0.500	mg/kg
bis(2-Chloroisopropyl)ether	50-150	20.0	0.500	mg/kg
Bromobenzene	50-150	20.0	0.500	mg/kg
Bromochloromethane	50-150	20.0	0.500	mg/kg
Bromodichloromethane	42-172	20.0	0.500	mg/kg
Bromoform	13-159	20.0	0.500	mg/kg
Bromomethane	D-144	20.0	0.500	mg/kg
Carbon Tetrachloride	43-143	20.0	0.500	mg/kg
Chlorobenzene	38-150	20.0	0.500	mg/kg
Chloroethane	46-137	20.0	0.500	mg/kg
Chloroform	49-133	20.0	0.500	mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 8010

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
1-Chlorohexane	50-150	20.0	0.500	mg/kg
Chloromethane	D-193	20.0	0.500	mg/kg
2-Chlorotoluene	50-150	20.0	0.500	mg/kg
Chlortoluene	50-150	20.0	0.500	mg/kg
DBCP	50-150	20.0	0.500	mg/kg
Dibromochlormethane	24-191	20.0	0.500	mg/kg
1,2-Dibromoethane	50-150	20.0	0.500	mg/kg
Dibromomethane	50-150	20.0	0.500	mg/kg
1,2-Dichlorobenzene	D-208	20.0	0.500	mg/kg
1,3-Dichlorobenzene	7-187	20.0	0.500	mg/kg
1,4-Dichlorobenzene	42-143	20.0	0.500	mg/kg
1,1-Dichloroethane	47-132	20.0	0.500	mg/kg
1,2-Dichloroethane	51-147	20.0	0.500	mg/kg
1,1-Dichloroethylene	28-167	20.0	0.500	mg/kg
cis-1,2-Dichloroethylene	50-150	20.0	0.500	mg/kg
trans-1,2-Dichloroethylene	38-155	20.0	0.500	mg/kg
1,2-Dichloropropane	44-156	20.0	0.500	mg/kg
1,3-Dichloropropane	50-150	20.0	0.500	mg/kg
2,2-Dichloropropane	50-150	20.0	0.500	mg/kg
1,1-Dichloropropene	50-150	20.0	0.500	mg/kg
cis-1,3-Dichloropropene	22-178	20.0	0.500	mg/kg
trans-1,3-Dichloropropene	22-178	20.0	0.500	mg/kg
Hexachlorobutadiene	50-150	20.0	0.500	mg/kg
Methylene Chloride	25-162	20.0	0.500	mg/kg
1,1,1,2-Tetrachlorethane	50-150	20.0	0.500	mg/kg
1,1,2,2-Tetrachlorethane	50-150	20.0	0.500	mg/kg
Tetrachloroethylene	26-162	20.0	0.500	mg/kg
1,2,3-Trichlorobenzene	50-150	20.0	0.500	mg/kg
1,2,4-Trichlorobenzene	50-150	20.0	0.500	mg/kg
1,1,1-Trichlorethane	41-138	20.0	0.500	mg/kg
1,1,2-Trichlorethane	39-136	20.0	0.500	mg/kg
Trichlorethylene	35-146	20.0	0.500	mg/kg
Trichlorofluoromethane	21-156	20.0	0.500	mg/kg
Trichloropropane	50-150	20.0	0.500	mg/kg
Vinyl Chloride	28-163	20.0	0.500	mg/kg

Method EPA 8015

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Acetone	50-150	40.0	0.500	mg/kg
Ethanol	50-150	40.0	0.500	mg/kg
Ethyl Acetate	50-150	40.0	0.500	mg/kg
Ethyl ether	50-150	40.0	0.500	mg/kg
Methyl ethyl keton	50-150	40.0	0.500	mg/kg
Methyl isobutyl ketone	50-150	40.0	0.500	mg/kg
2-Propanol (Isopropyl Alcohol)	50-150	40.0	0.500	mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 8020

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Benzene	39-159	20.0	0.001 mg/kg
Toluene	46-148	20.0	0.001 mg/kg
Ortho Xylene	50-150	20.0	0.001 mg/kg
Para Xylene	50-150	20.0	0.001 mg/kg
Meta Xylene	50-150	20.0	0.001 mg/kg
Chlorobenzene	55-135	20.0	0.001 mg/kg
Ethyl Benzene	32-160	20.0	0.001 mg/kg
1,2-Dichlorobenzene	37-154	20.0	0.001 mg/kg
1,3-Dichlorobenzene	50-141	20.0	0.001 mg/kg
1,4-Dichlorobenzene	42-143	20.0	0.001 mg/kg

Method EPA 8040

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
2-sec-Butyl-4-6-dinitrophenol	50-150	30.0	0.010 mg/kg
2-Chlorophenol	23-134	30.0	0.010 mg/kg
2,4-Dichlorophenol	39-135	30.0	0.010 mg/kg
2,4-Dimethylphenol	42-109	30.0	0.010 mg/kg
2,4-Dinitrophenol	D-191	30.0	0.050 mg/kg
2-Methyl-4,6-Dinitrophenol	D-181	30.0	0.050 mg/kg
2-Methylphenol	50-150	30.0	0.010 mg/kg
4-Methylphenol	50-150	30.0	0.010 mg/kg
2-Nitrophenol	29-182	30.0	0.010 mg/kg
4-Nitrophenol	29-182	30.0	0.050 mg/kg
4-Chloro-3-methylphenol	22-147	30.0	0.020 mg/kg
Pentachlorophenol	14-176	30.0	0.050 mg/kg
Phenol	5-112	30.0	0.010 mg/kg
2,3,4,6-Tetrachlorophenol	50-150	30.0	0.010 mg/kg
2,3,5,6-Tetrachlorophenol	50-150	30.0	0.010 mg/kg
2,3,4-Trichlorophenol	37-144	30.0	0.010 mg/kg
2,3,5-Trichlorophenol	37-144	30.0	0.010 mg/kg
2,3,6-Trichlorophenol	37-144	30.0	0.010 mg/kg
2,4,5-Trichlorophenol	37-144	30.0	0.010 mg/kg
2,4,6-Trichlorophenol	37-144	30.0	0.010 mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
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Method EPA 8080

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Hexachlorobenzene	50-150	30.0	N/A
Dibutylchlorendate	20-150	30.0	N/A
Aldrin	34-132	43.0	0.020 mg/kg
Alpha BHC	37-134	30.0	0.020 mg/kg
Beta BHC	17-147	30.0	0.020 mg/kg
Delta BHC	19-140	30.0	0.020 mg/kg
Chlordane	45-119	30.0	0.020 mg/kg
o,p - DDD	31-141	30.0	0.020 mg/kg
p,p - DDD	31-141	30.0	0.020 mg/kg
o,p - DDE	30-145	30.0	0.020 mg/kg
p,p - DDE	30-145	30.0	0.020 mg/kg
o,p - DDT	23-134	50.0	0.020 mg/kg
p,p - DDT	23-134	50.0	0.020 mg/kg
Dieldrin	31-134	38.0	0.020 mg/kg
Endosulfan I	45-153	30.0	0.020 mg/kg
Endosulfan II	D-202	30.0	0.020 mg/kg
Endosulfan Sulfate	26-144	30.0	0.020 mg/kg
Endrin	42-139	45.0	0.020 mg/kg
Endrin Aldehyde	50-150	30.0	0.020 mg/kg
Heptachlor	35-130	31.0	0.020 mg/kg
Heptachlor Epoxide	37-142	30.0	0.020 mg/kg
Lindane	46-127	50.0	0.020 mg/kg
Methoxychlor	50-150	30.0	0.500 mg/kg
Toxaphene	41-126	30.0	0.500 mg/kg
PCB 1016	50-114	30.0	0.200 mg/kg
PCB 1221	15-178	30.0	0.200 mg/kg
PCB 1232	10-215	30.0	0.200 mg/kg
PCB 1242	39-150	30.0	0.200 mg/kg
PCB 1248	38-158	30.0	0.200 mg/kg
PCB 1254	29-131	30.0	0.200 mg/kg
PCB 1260	8-127	30.0	0.200 mg/kg

Method EPA 8140

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
1,3-Dimethyl-2-nitrobenzene	50-150	30.0	N/A
9-Nitroanthracene	50-150	30.0	N/A
Azinphos Methyl	50-150	30.0	0.002 mg/kg
Bolstar	50-150	30.0	0.002 mg/kg
Chlorpyrifos	50-150	30.0	0.002 mg/kg
Coumaphos	50-150	30.0	0.002 mg/kg
Demeton-o,s	50-150	30.0	0.002 mg/kg
Diazinon	50-150	30.0	0.002 mg/kg
Dichlorvos	50-150	30.0	0.002 mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 8140

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
Disulfoton	50-150	30.0	0.002 mg/kg
Ethoprop	50-150	30.0	0.002 mg/kg
Fensulfoton	50-150	30.0	0.002 mg/kg
Fenthion	50-150	30.0	0.002 mg/kg
Merphos	50-150	30.0	0.002 mg/kg
Mevinphos	50-150	30.0	0.002 mg/kg
Naled	50-150	30.0	0.002 mg/kg
Parathion Methyl	50-150	30.0	0.002 mg/kg
Phorate	50-150	30.0	0.002 mg/kg
Ronnel	50-150	30.0	0.002 mg/kg
Stirophos	50-150	30.0	0.002 mg/kg
Tokuthion	50-150	30.0	0.002 mg/kg
Trichlornate	50-150	30.0	0.002 mg/kg

Method EPA 8150

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
2,4,5-T	50-150	30.0	0.001 mg/kg
2,4-D	50-150	30.0	0.010 mg/kg
2,4,5-TP (Silvex)	50-150	30.0	0.001 mg/kg

Method EPA 8240

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL
1,2-Dichloroethane-d4	70-121	30.0	N/A
Toluene-d8	81-117	30.0	N/A
BFB	74-121	30.0	N/A
Acetone	50-150	30.0	0.500 mg/kg
Benzene	66-142	21.0	0.005 mg/kg
Bromodichloromethane	35-155	30.0	0.025 mg/kg
Bromoform	45-169	30.0	0.025 mg/kg
Bromomethane	D-242	30.0	0.025 mg/kg
Carbon Disulfide	50-150	30.0	0.250 mg/kg
Carbon Tetrachloride	70-140	30.0	0.025 mg/kg
Chlorobenzene	60-133	21.0	0.005 mg/kg
Chloroethane	14-230	30.0	0.025 mg/kg
Chloroform	51-138	30.0	0.025 mg/kg
Chloromethane	D-273	30.0	0.025 mg/kg
Dibromochlormethane	53-149	30.0	0.025 mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method EPA 8240

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
1,2-Dichlorobenzene	50-150	30.0	0.025	mg/kg
1,3-Dichlorobenzene	50-150	30.0	0.025	mg/kg
1,4-Dichlorobenzene	50-150	30.0	0.025	mg/kg
1,1-Dichloroethane	59-172	21.0	0.025	mg/kg
1,2-Dichloroethane	49-155	30.0	0.025	mg/kg
1,1-Dichloroethylene	D-234	30.0	0.025	mg/kg
trans-1,2-Dichloroethylene	54-156	30.0	0.025	mg/kg
1,2-Dichloropropane	D-210	30.0	0.025	mg/kg
cis-1,3-Dichloropropene	D-227	30.0	0.025	mg/kg
trans-1,3-Dichloropropene	17-183	30.0	0.025	mg/kg
Ethanol	50-150	30.0	500.000	mg/kg
Ethyl Benzene	37-162	30.0	0.025	mg/kg
2-Hexanone	50-150	30.0	0.250	mg/kg
Methylene Chloride	D-221	30.0	0.025	mg/kg
2-Butanone (MEK)	50-150	30.0	0.500	mg/kg
4-Methyl-2-pentanone (MIBK)	50-150	30.0	5.250	mg/kg
Styrene	50-150	30.0	0.025	mg/kg
1,1,2,2-Tetrachloroethane	46-157	30.0	0.025	mg/kg
Tetrachloroethylene	64-148	30.0	0.025	mg/kg
Toluene	59-139	21.0	0.025	mg/kg
1,1,1-Trichloroethane	52-162	30.0	0.025	mg/kg
1,1,2-Trichloroethane	52-150	30.0	0.025	mg/kg
Trichlorethylene	62-137	24.0	0.025	mg/kg
Trichlorofluoromethane	17-181	30.0	0.025	mg/kg
Vinyl Acetate	50-150	30.0	0.500	mg/kg
Vinyl Chloride	D-251	30.0	0.025	mg/kg
Xylenes	50-150	30.0	0.025	mg/kg
Acrolein	50-150	30.0	1.000	mg/kg
Acrylonitrile	50-150	30.0	1.000	mg/kg

Method EPA 8270

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
2-Fluorobiphenyl	30-115	30.0	N/A	
Nitrobenzene-d5	23-120	30.0	N/A	
p-Terphenyl-d14	18-137	30.0	N/A	
2-Fluorophenol	25-121	30.0	N/A	
Phenol-d6	24-113	30.0	N/A	
2,4,6-Tribromophenol	19-122	30.0	N/A	
Acenaphthene	31-137	19.0	0.100	mg/kg
Acenaphthylene	33-145	30.0	0.100	mg/kg
Aniline	50-150	30.0	0.500	mg/kg
Anthracene	27-133	30.0	0.100	mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
for
ORGANIC METHODS

Method EPA 8270

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Benzo(a)anthracene	33-143	30.0	0.100	mg/kg
Benzo(a)pyrene	17-163	30.0	0.100	mg/kg
Benzo(b)fluoranthene	24-159	30.0	0.100	mg/kg
Benzo(k)fluoranthene	11-162	30.0	0.100	mg/kg
Benzo(g,h,i)perylene	D-219	30.0	0.100	mg/kg
Benzylalcohol	50-150	30.0	0.200	mg/kg
bis(2-Chloroethoxy)methane	33-184	30.0	0.100	mg/kg
bis(2-Chloroethyl)ether	12-158	30.0	0.100	mg/kg
bis(2-Chloroisopropyl)ether	36-166	30.0	0.100	mg/kg
bis(2-Ethylhexly)phthalate	29-137	30.0	0.100	mg/kg
4-Bromophenylphenylether	65-114	30.0	0.100	mg/kg
Butylbenzylphthalate	D-152	30.0	0.100	mg/kg
Chloroaniline	50-150	30.0	0.200	mg/kg
Chloronaphthalene	60-180	30.0	0.100	mg/kg
Chlorophenylphenylether	25-158	30.0	0.100	mg/kg
Chrysene	17-168	30.0	0.100	mg/kg
Dibenzo(a,h)anthracene	D-227	30.0	0.100	mg/kg
Dibenzofuran	50-150	30.0	0.100	mg/kg
1,2-Dichlorbenzene	32-129	30.0	0.100	mg/kg
1,3-Dichlorobenzene	D-172	30.0	0.100	mg/kg
1,4-Dichlorobenzene	28-104	27.0	0.100	mg/kg
3,3'-Dichlorbenzidine	8-213	30.0	0.200	mg/kg
Diethylphthalate	D-114	30.0	0.100	mg/kg
Dimethylphthalate	D-112	30.0	0.100	mg/kg
Di-n-butylphthalate	1-118	30.0	0.100	mg/kg
2,4-Dinitrotoluene	28-100	47.0	0.100	mg/kg
2,6-Dinitrotoluene	50-158	30.0	0.100	mg/kg
Di-n-octylphthalate	4-146	30.0	0.100	mg/kg
Fluoranthene	26-137	30.0	0.100	mg/kg
Fluorene	59-121	30.0	0.100	mg/kg
Hexachlorobenzene	50-150	30.0	0.100	mg/kg
Hexachlorobutadiene	24-116	30.0	0.100	mg/kg
Hexachlorocyclopentadiene	50-150	30.0	0.200	mg/kg
Hexachloroethane	40-113	30.0	0.100	mg/kg
Indeno(1,2,3-c,d)pyrene	50-150	30.0	0.100	mg/kg
Isophorone	21-196	30.0	0.100	mg/kg
2-Methylnaphthalene	50-150	30.0	0.100	mg/kg
Naphthalene	21-133	30.0	0.100	mg/kg
Nitrobenzene	35-180	30.0	0.100	mg/kg
N-Nitrosodimethylamine	50-150	30.0	0.100	mg/kg
N-Nitrosodi-N-propylamine	41-126	38.0	0.100	mg/kg
N-Nitrosodiphenylamine	50-150	30.0	0.100	mg/kg
2-Nitroanaline	50-150	30.0	0.500	mg/kg
3-Nitroanaline	50-150	30.0	0.500	mg/kg
4-Nitroanaline	50-150	30.0	0.500	mg/kg
Phenanthrene	54-120	30.0	0.100	mg/kg

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
for
ORGANIC METHODS

Method EPA 8270

CONSTITUENT	ACCURACY % RECOVERED	PRECISION RPD	MDL	
Pyrene	35-142	36.0	0.100	mg/kg
1,2,4-Trichlorbenzene	38-107	23.0	0.100	mg/kg
2-Chlorophenol	25-102	50.0	0.100	mg/kg
2,4-Dichlorophenol	39-135	30.0	0.100	mg/kg
2,4-Dimethylphenol	42-109	30.0	0.100	mg/kg
4,6-Dinitro-o-cresol	D-181	30.0	0.500	mg/kg
2,4-Dinitrophenol	D-191	30.0	0.500	mg/kg
2-Methylphenol	50-150	30.0	0.100	mg/kg
4-Methylphenol	50-150	30.0	0.100	mg/kg
2-Nitrophenol	29-182	30.0	0.100	mg/kg
4-Nitrophenol	11-114	50.0	0.500	mg/kg
p-Chloro-m-cresol	26-103	33.0	0.200	mg/kg
Pentachlorophenol	17-109	47.0	0.500	mg/kg
Phenol	26- 90	35.0	0.100	mg/kg
2,4,5-Trichlorphenol	50-150	30.0	0.100	mg/kg
2,4,6-Trichlorphenol	37-144	30.0	0.100	mg/kg
Azobenzene	50-150	30.0	0.500	mg/kg
Benzidine	50-150	30.0	0.500	mg/kg
Benzoic Acid	50-150	30.0	0.500	mg/kg

Method TOC

CONSTITUENT		ACCURACY % RECOVERED	PRECISION RPD	MDL	
TOC	415.1	80-120	20.0	0.300	mg/L
TOC	9060	80-120	20.0	3.000	mg/kg

Method TOX

CONSTITUENT		ACCURACY % RECOVERED	PRECISION RPD	MDL	
TOX	9020	80-120	20.0	0.500	ug/L

TABLE V-1 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for ORGANIC METHODS

Method UGSTA-L

CONSTITUENT		ACCURACY % RECOVERED	PRECISION RPD	MDL	
Benzene	602	39-150	20.0	0.050	ug/L
Ethyl Benzene	602	32-160	20.0	0.050	ug/L
Toluene	602	46-148	20.0	0.001	ug/L
Xylene	602	50-150	20.0	0.001	ug/L
TPH-Gas	8015	70-130	40.0	0.050	mg/L
TPH-Desiel	8015M	70-130	40.0	0.050	mg/L
TPH-By IR	418.1	50-150	20.0	0.050	mg/L
EDB	624	50-150	20.0	0.050	ug/L
Total Lead	7421	75-125	20.0	5.000	ug/L
Organic Lead	DHS/LUFT	50-150	20.0	5.000	ug/L

Method UGSTA-S

CONSTITUENT		ACCURACY % RECOVERED	PRECISION RPD	MDL	
Benzene	8020	39-159	20.0	0.001	mg/kg
Ethyl Benzene	8020	32-160	20.0	0.001	mg/kg
Toluene	8020	46-148	20.0	0.001	mg/kg
Xylene	8020	50-150	20.0	0.001	mg/kg
TPH-Gas	8015	35-100	40.0	0.500	mg/kg
TPH-Desiel	8015M	35-100	40.0	0.500	mg/kg
TPH-By IR	418.1	50-150	20.0	1.000	mg/kg
EDB	8010	50-150	20.0	0.500	mg/kg
Total Lead	7420	75-125	20.0	4.000	mg/kg
Soluble Lead	7420	30-100	20.0	0.400	mg/kg
Organic Lead	DHS/LUFT	50-150	20.0	0.400	mg/kg

TABLE V-3

QUALITY CONTROL ACCEPTANCE CRITERIA for RADIO CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
Gross Alpha	900.0	80-120	20.0	0.100 pCi/L
Gross Beta	900.0	80-120	20.0	0.100 pCi/L
Radon	913.0	80-120	20.0	10.000 pCi/L
Strontium 90	905.0	80-120	20.0	1.000 pCi/L
Total Radium	900.1	80-120	20.0	0.100 pCi/L
Tritium	906.0	80-120	20.0	200.000 pCi/L
Uranium	908.0	80-120	20.0	0.100 pCi/L

TABLE V-2

QUALITY CONTROL ACCEPTANCE CRITERIA
for
INORGANIC CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
% Moisture	ASA/UL	NA	30.0	N/A
% Solids	ASA/UL	NA	30.0	N/A
Alkalinity (as CaC03)	310.0	NA	20.0	0.100 mg/L
Alkalinity (as CaC03)	310.0	NA	30.0	0.100 mg/kg
Alkalinity (as CaCo3)	310.0	NA	20.0	0.100 mg/L
Aluminum	6010	70-130	30.0	5.000 mg/kg
Aluminum	7021	75-125	20.0	0.005 mg/L
Aluminum	202.2	75-125	20.0	5.000 ug/L
Ammonia	350.1	80-120	20.0	0.100 mg/L
Ammonia	350.1	70-130	30.0	0.100 mg/kg
Ammonia-N	350.1	80-120	20.0	0.100 mg/L
Ammonia-N	350.1	70-130	30.0	0.100 mg/kg
Ammonium Nitrogen	350.1	80-120	20.0	0.100 mg/L
Ammonium Nitrogen	350.1	70-130	30.0	0.100 mg/kg
Antimony	7041	D-125	50.0	0.010 mg/L
Antimony	7041	65-135	30.0	0.500 mg/kg
Antimony	204.2	75-125	20.0	2.000 ug/L
Arsenic	7060	75-125	20.0	0.005 mg/L
Arsenic	7060	65-135	30.0	0.300 mg/kg
Arsenic	206.2	75-125	20.0	1.000 ug/L
BOD	405.1	80-120	20.0	0.100 mg/L
BOD - Soluble	405.1	80-120	20.0	0.100 mg/L
Barium	6010	80-120	20.0	0.010 mg/L
Barium	6010	70-130	30.0	0.100 mg/kg
Barium	200.7	80-120	20.0	2.000 ug/L
Beryllium	6010	D-120	50.0	0.005 mg/L
Beryllium	6010	70-130	30.0	0.050 mg/kg
Beryllium	200.7	80-120	20.0	1.000 ug/L
Bicarbonate	310.1	NA	20.0	0.100 meq/L
Bicarbonate	310.1	NA	20.0	0.100 mg/L
Boron	6010	80-120	20.0	0.010 mg/L
Boron	6010	70-130	30.0	0.010 mg/kg
Boron	200.7	80-120	20.0	0.010 mg/L
Boron	200.7	80-120	20.0	5.000 ug/L
COD	410.2	75-125	20.0	0.400 mg/L
COD - Soluble	410.2	75-125	20.0	0.400 mg/L
Cadmium	6010	80-120	20.0	0.030 mg/L
Cadmium	6010	70-130	30.0	0.300 mg/kg
Cadmium	7131	80-120	20.0	0.001 mg/L
Cadmium	213.2	75-125	20.0	0.100 ug/L
Calcium	6010	80-120	20.0	0.001 mg/L
Calcium	6010	70-130	30.0	5.000 mg/kg
Calcium	200.7	80-120	20.0	0.100 mg/L
Carbon Dioxide	SM406	NA	20.0	0.100 mg/L
Carbonate	310.1	NA	20.0	0.100 meq/L
Carbonate	310.1	NA	20.0	0.100 mg/L

TABLE V-2 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for INORGANIC CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
Chloride	SM407C	80-120	20.0	0.100 meq/L
Chloride	SM407C	80-120	20.0	0.100 mg/L
Chloride	SM407C	70-130	30.0	0.100 mg/kg
Chlorine Residual	330.3	NA	20.0	0.010 mg/L
Chromium	6010	D-120	50.0	0.030 mg/L
Chromium	6010	70-130	30.0	0.001 mg/kg
Chromium	7191	80-120	20.0	0.001 mg/L
Chromium	218.2	75-125	20.0	1.000 ug/L
Chromium VI	7196	D-120	20.0	0.001 mg/L
Chromium VI	7196	D-130	30.0	0.001 mg/kg
Cobalt	6010	D-120	50.0	0.030 mg/L
Cobalt	6010	70-130	30.0	0.005 mg/kg
Cobalt	200.7	80-120	20.0	5.000 ug/L
Color	110.3	NA	20.0	0.300 units
Conductivity	120.1	80-120	20.0	0.100 umhos
Copper	6010	D-120	50.0	0.030 mg/L
Copper	6010	70-130	30.0	0.300 mg/kg
Copper	7210	80-120	20.0	0.005 mg/L
Copper	7210	70-130	30.0	0.005 mg/kg
Copper	200.7	80-120	20.0	5.000 ug/L
Copper	220.1	80-120	20.0	5.000 ug/L
Corrosivity		NA	30.0	N/A
Corrosivity (pH)		NA	20.0	N/A
Cyanide, Total	335.2	75-125	20.0	0.005 mg/L
Cyanide, Total	335.2	65-135	30.0	0.005 mg/kg
Dilute Acid or Base		NA	20.0	0.000
E. C.	120.1	80-120	20.0	0.100 umhos
Fluoride by Dist.	340.1	70-130	30.0	0.010 mg/L
Fluoride by electrode	340.2	80-120	20.0	0.010 mg/L
Gold	231.1	80-120	20.0	0.005 mg/L
Gold	231.1	70-130	30.0	0.005 mg/kg
Gypsum Requirement	Calc.	NA	N/A	N/A
Hardness, Total	130.2	80-120	20.0	0.100 mg/L
Hydroxide	310.0	NA	20.0	0.100 mg/L
Ignitability		NA	30.0	N/A
Ignitability		NA	N/A	N/A
Iron	6010	80-120	20.0	0.005 mg/L
Iron	6010	70-130	30.0	0.300 mg/kg
Iron	200.7	80-120	20.0	0.005 mg/L
Iron	200.7	80-120	20.0	5.000 ug/L
Iron	236.1	80-120	20.0	5.000 ug/L
Kjeldahl Nitrogen	351.2	75-125	20.0	0.100 mg/L
Kjeldahl Nitrogen	351.2	65-135	30.0	0.100 mg/kg
Langelier Index	SM203	NA	N/A	0.100 mg/L

TABLE V-2 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
for
INORGANIC CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
Lead	7420	D-120	50.0	0.040 mg/L
Lead	7420	70-130	30.0	0.400 mg/kg
Lead	7421	75-125	20.0	0.040 mg/L
Lead	7421	65-135	30.0	0.001 mg/kg
Lead	239.2	75-125	20.0	0.500 ug/L
Lithium	7430	80-120	20.0	0.005 mg/L
Lithium	7430	70-130	30.0	0.005 mg/kg
Lithium	SM303A	80-120	20.0	5.000 ug/L
MBAS	425.1	70-130	20.0	0.002 mg/L
Magnesium	6010	80-120	20.0	0.001 mg/L
Magnesium	6010	70-130	30.0	5.000 mg/kg
Magnesium	200.7	80-120	20.0	0.100 mg/L
Manganese	6010	80-120	20.0	0.003 mg/L
Manganese	6010	70-130	30.0	0.200 mg/kg
Manganese	200.7	80-120	20.0	0.005 mg/L
Manganese	200.7	80-120	20.0	3.000 ug/L
Manganese	243.1	80-120	20.0	3.000 ug/L
Mercury	7470	D-125	50.0	0.001 mg/L
Mercury	7470	65-135	30.0	0.001 mg/kg
Mercury	7471	75-125	20.0	0.001 mg/L
Mercury	7471	65-135	30.0	0.005 mg/kg
Mercury	245.1	75-125	20.0	0.100 ug/L
Molybdenum	6010	D-120	50.0	0.030 mg/L
Molybdenum	6010	70-130	30.0	0.003 mg/kg
Molybdenum	200.7	80-120	20.0	5.000 ug/L
Nickel	6010	D-120	50.0	0.030 mg/L
Nickel	6010	70-130	30.0	0.300 mg/kg
Nickel	249.1	80-120	20.0	5.000 ug/L
Nitrate	353.2	80-120	20.0	0.100 meq/L
Nitrate	353.2	80-120	20.0	0.100 mg/L
Nitrate	353.2	70-130	30.0	0.100 mg/kg
Nitrate Nitrogen	353.2	80-120	20.0	0.020 mg.L
Nitrate Nitrogen	353.2	80-120	20.0	0.020 mg/L
Nitrate Nitrogen	353.2	70-130	30.0	0.020 mg/kg
Nitrite	353.2	80-120	20.0	0.100 mg/L
Nitrite	353.2	70-130	30.0	0.100 mg/kg
Nitrite Nitrogen	353.2	80-120	20.0	0.020 mg/L
Nitrite Nitrogen	353.2	70-130	30.0	0.020 mg/kg
Nitrogen, Organic	Calc.	NA	20.0	0.100 mg/L
Nitrogen, Organic	Calc.	NA	30.0	0.100 mg/kg
Nitrogen, Total	351.2	80-120	20.0	0.100 mg/L
Nitrogen, Total	351.2	70-130	30.0	0.100 mg/kg
Nitrogen, Total	Calc.	NA	20.0	0.100 mg/L
Nitrogen, Total	Calc.	NA	30.0	0.100 mg/kg
Odor	140.1	NA	20.0	0.100 TON
Oil and Grease	413.1	NA	20.0	0.100 mg/L
Oil and Grease	413.1	NA	30.0	0.100 mg/kg
Oxygen, dissolved	360.1	NA	20.0	0.050 mg/L

TABLE V-2 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA
for
INORGANIC CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
Phenols	420.1	75-125	20.0	0.010 mg/L
Phenols	420.1	65-135	30.0	0.010 mg/kg
Phosphate	365.2	80-120	20.0	0.010 mg/L
Phosphate (Phosphorous	365.2	70-130	30.0	0.010 mg/kg
Phosphorous, Total	365.2	75-125	20.0	0.010 mg/L
Phosphorous, Total	365.4	75-125	20.0	0.010 mg/L
Phosphorous, Total	365.4	65-135	30.0	0.010 mg/kg
Potassium	6010	80-120	20.0	0.001 mg/L
Potassium	6010	70-130	30.0	5.000 mg/kg
Potassium	200.7	80-120	20.0	0.100 mg/L
Reactivity Sulfide		NA	30.0	N/A
Selenium	7740	75-125	20.0	0.001 mg/L
Selenium	7740	65-135	30.0	0.001 mg/kg
Selenium	270.2	75-125	20.0	0.500 ug/L
Silica	6010	80-120	20.0	0.100 mg/L
Silver	7760	D-120	50.0	0.030 mg/L
Silver	7760	70-130	30.0	0.300 mg/kg
Silver	7761	75-125	20.0	0.001 mg/L
Silver	7761	65-135	30.0	0.001 mg/kg
Silver	272.2	75-125	20.0	1.000 ug/L
Sodium	6010	80-120	20.0	0.001 mg/L
Sodium	6010	70-130	30.0	5.000 mg/kg
Sodium	200.7	80-120	20.0	0.100 mg/L
Solids, Settleable	160.5	NA	20.0	0.010 ml/L
Solids, Total	160.1	NA	20.0	0.400 mg/L
Solids, suspended	160.2	NA	20.0	1.000 mg/L
Solids, volatile	160.4	NA	20.0	1.000 mg/L
Sulfate	375.4	80-120	20.0	0.100 meq/L
Sulfate	375.4	80-120	20.0	0.100 mg/L
Sulfate	375.4	70-130	30.0	0.100 mg/kg
Sulfide	376.2	NA	20.0	0.005 mg/L
Sulfide	376.2	NA	30.0	0.005 mg/kg
Sulfide, Dissolved	376.2	NA	20.0	0.005 mg/L
TDS	160.1	NA	20.0	0.400 mg/L
TDS	160.1	NA	20.0	0.400 ml/L
TDS by Summation	Calc.	NA	20.0	0.100 mg/L
Tannin & Lignin	SM513	NA	20.0	0.000 mg/L
Thallium	7840	D-125	50.0	0.030 mg/L
Thallium	7840	65-135	30.0	0.300 mg/kg
Thallium	7841	75-125	20.0	0.002 mg/L
Thallium	7841	65-135	30.0	0.002 mg/kg
Thallium	279.2	75-125	20.0	2.000 ug/L
Tin	7871	75-125	20.0	0.005 mg/L
Tin	7871	65-135	30.0	0.005 mg/kg
Turbidity	180.1	NA	20.0	0.020 NTU
Vanadium	6010	D-120	50.0	0.030 mg/L
Vanadium	6010	70-130	30.0	0.300 mg/kg
Vanadium	200.7	80-120	20.0	5.000 ug/L

TABLE V-2 (cont'd.)

QUALITY CONTROL ACCEPTANCE CRITERIA for INORGANIC CHEMICAL METHODS

CONSTITUENT	METHOD	Accuracy % Recovered	Precision RPD	MDL
Zinc	6010	D-120	50.0	0.030 mg/L
Zinc	6010	70-130	30.0	0.300 mg/kg
Zinc	7950	80-120	20.0	0.005 mg/L
Zinc	7950	70-130	30.0	0.005 mg/kg
Zinc	200.7	80-120	20.0	5.000 ug/L
Zinc	289.1	80-120	20.0	5.000 ug/L
pH	150.0	NA	20.0	N/A
pH	150.1	NA	20.0	N/A
pH	150.1	NA	20.0	N/A

TABLE V-4

BFB KEY ION ABUNDANCE CRITERIA

Mass	Ion Abundance Criteria
50	15 to 40% of mass 95
75	30 to 60% of mass 95
95	base peak, 100% relative abundance
96	5 to 9% of mass 95
173	less than 2% of mass 174
174	greater than 50% of mass 95
175	5 to 9% of mass 174
176	greater than 95% but less than 101% of mass 174
177	5 to 9% of mass 176

TABLE V-5

DFTPP KEY IONS AND ION ABUNDANCE CRITERIA

Mass	Ion Abundance Criteria
51	30 to 60% of mass 198
68	less than 2% of mass 69
70	less than 2% of mass 69
127	40 to 60% of mass 198
197	less than 1% of mass 198
198	base peak, 100% relative abundance
199	5 to 9% of mass 198
275	10 to 30% of mass 198
365	greater than 1% of mass 198
441	Present but less than mass 443
442	greater than 40% of mass 198
443	17 to 23% of mass 442

VI. Internal Quality Control

Introduction

An internal quality control program requires a set of routine internal procedures for assuring that the data generated from a measurement system meets prescribed criteria for data quality. An effective internal QC program must be capable of measuring and controlling the quality of the data, in terms of precision, accuracy, and completeness. Data is considered to be complete only if all method specific control measures have been taken, and the data can only be reported when all acceptance criteria have been met, including corrective actions , if applicable.

This section identifies QC protocols associated with analytical procedures. Included are general quality control measures as well as specific quality control checks which provide continual control and assessment of data quality, in terms of precision, accuracy, and completeness. Table VI-1 contains general QC measure for some representative wet chemistry methods. Figure VI-1 is an example of an FGL Batch Control Chart. FGL's LIMS System is also capable of generating historic control charts. Control limits are updated quarterly bsed on actual data. Figure VI-2 is an FGL QC Inspection Report Form, and Figure VI-3 is a copy of FGL's laboratory certificate issued by California Department of Health Services.

Sources and Preparation of Standards

Chemicals used in the laboratory are obtained from major suppliers and are usually reagent grade or better. All reagents are labeled with date received, and date opened. Standards are also obtained from these suppliers and certification documents are kept on file. The date the standard was received is recorded on the document. Labels are attached to each standard and contain the following: Element, date prepared, prepared by, source verification and expiration date. A log book for the standards prepared from the commercial standards is also kept which is labeled indicating the source, the volume of standard used, the date prepared, the name of the analyst/preparer, and how verified. In those instances where the above procedure is not possible, the chemist notebook will contain this information.

EPA 500 and 600 Series and SW846 GC Methods

Analytical quality control protocols for GC analyses and described in Method 8000 of SW846, 3rd ed. and equivalent procedures in the 500 and 600 series EPA methods. They include the following:

- Initial demonstration of capability
- Calibration
- Analysis of surrogate spiked samples
- Method blank analyses
- Analysis of matrix spike/matrix spike duplicates
- Duplicate sample analyses
- Analysis of QC check samples and/or method spikes
- Retention time window checks

These procedures are described below.

Initial Demonstration of Capability

Before analyzing samples, the laboratory must demonstrate the ability to generate accurate and precise data. This is achieved by analyzing four aliquots of a QC check sample (QCCS) by the same procedure intended for sample analysis. The laboratory must calculate the average recovery and the standard deviation of the recovery for each analyte of interest using the four results. The mean recovery and standard deviation for each analyte must be compared with the corresponding acceptance criteria published in the EPA method. If and only if the experimental accuracy and precision data are acceptable, certification for the method is pursued through the Environmental Laboratory Accreditation Program offered by the California Department of Health Services.

Calibration - Calibration standards at three concentration levels are prepared by dilution of stock standards. The average calibration factor is acceptable if the RSD between the factors is within 20 percent. Daily calibration checks are acceptable if the daily calibration factor is within 30 percent of the previous three level average.

Surrogate Spikes - A surrogate standard is a compound not expected to occur in an environmental sample but has chemical behavior similar to that of the target analytes. Surrogate spikes are used according to specific method requirements published by the EPA. They serve as a check on the extraction process where extraction is a necessary part of the analytical procedure. When surrogate recovery is within limits it indicates that the extraction was complete. If the surrogate spike recovery in any sample is not within limits:

- Check for errors in calculations, surrogate solutions and standards. Check instrument performance.

- Recalculate the data and/or reanalyze the extract if any of the above checks reveal a problem.

- Re-extract and reanalyze the sample if none of the above are a problem, or flag the data as "estimated concentration".

Method Blank Analysis - Before processing any samples, the analyst must demonstrate through the analysis of a reagent water method blank that all glassware and reagents are free of interferences. Each time a set of samples is extracted, a method blank must be processed to check for laboratory contamination. The blank samples should be carried through all stages of the sample preparation and analysis. Lack of interference is demonstrated if all target analytes with the exception of common laboratory reagents are below their MDLs.

QC Check Sample Analyses - QC check samples may be obtained directly from EPA or prepared from suitable reference standards, but must be prepared independently of calibration standards. The QCCS usually contains the analyte(s) of interest at a concentration in the mid-calibration range. A QCCS should be analyzed if matrix spike recoveries are unacceptable to verify that the analysis is in control.

Matrix Spike/Matrix Spike Duplicate Analyses (MS/MSD) - EPA protocol recommends analysis of matrix spike and matrix spike duplicate samples for each analytical batch or matrix type at a minimum frequency of five percent. The method recovery limits and relative percent difference (RFD) acceptance criteria are shown in Section V. When matrix spike results fall outside limits published in the respective methods, a QCCS should be analyzed to demonstrate control. If spike recoveries are outside normal limits due to matrix problems, the data should be reported noting matrix interference.

EPA 600 series protocol requires analysis of one matrix spike at a ten percent minimum frequency. A single matrix spike analysis will suffice for low level water samples where matrix effects are less likely. These recovery measurements serve as useful indicators of accuracy.

Duplicate Sample Analysis - EPA protocol requires duplicate sample analysis at a ten percent minimum frequency. The relative percent difference (RPD) calculated from MS/MSD analyses provides an assessment of precision. This approach is useful for typically having no detectable amounts of analyte.

Retention Time Windows - The laboratory calculates retention time windows for each standard on each GC column whenever a new GC column is installed. To establish windows, make three injections of standard throughout the course of a 72 hour period. Calculate the standard deviation of the three individual retention times for each standard. For multi-response products, (i.e. PCB's) choose one major peak from the pattern. If the standard deviation for a particular standard is zero, use the standard deviation of a close eluting, similar compound to develop a valid retention time window.

The laboratory establishes daily retention time windows for each analyte. The absolute retention time for each daily calibration standard serves as the midpoint of the window for that day. The daily retention time window equals the midpoint + three standard deviations as determined above.

EPA 500 and 600 Series and SW846 GC/MS Methods

Analytical quality control protocols for GC/MS analyses are described in Method 8000 of SW846, 3rd ed. and equivalent methods in the 500 and 600 series EPA methods. They include:

- Initial demonstration of capability
- Calibration verification
- Surrogate standard spike samples
- Reagent (Method) blank analyses
- Matrix spike duplicate analyses
- Analysis of duplicate samples (EPA 600 series)
- Mass spectrometer sensitivity check
- Daily GC/MS performance tests

Initial Demonstration of Capability - Before analyzing samples the laboratory must demonstrate the ability to generate accurate and precise data. This is achieved by analyzing four aliquots of a QC check sample (QCCS) by the same procedure intended for sample analysis. The laboratory must calculate the average recovery and the standard deviation of the recovery for each analyte of interest using the four results. The mean recovery and standard deviation for each analyte must be compared with the corresponding acceptance criteria published in the EPA method. If, and only if, the experimental accuracy and precision data are acceptable, certification for the method is pursued through the Environmental Laboratory Accreditation Program offered by the California Department of Health Services.

Calibration - Calibration standards at five concentration levels are prepared by dilution of stock standards. The average calibration factor is acceptable if the RSD between the factors is within 20 percent. Daily calibration checks are acceptable if the daily calibration factor is within 25 percent of the previous five level average.

Surrogate Spikes - All samples are spiked with surrogate standards as described in the EPA method. The method recovery acceptance limits for GC/MS methods are included in Section V, Table V-1. If the surrogate spike recovery in any sample is not within limits;

- Check for errors in calculations, reagents and standards. Check instrument performance.
- Recalculate the data and/or reanalyze the sample if any of the above checks reveal a problem
- Re-extract and reanalyze the sample if none of the above reveal the problem, or flag the data as "estimated concentration"

Method Blank Analyses - A method blank should be analyzed every 12 hours to demonstrate that interferences are below critical limits. The blank samples should be carried through all stages of the sample preparation (including extraction for semi-volatiles) and analysis. Lack of interference is demonstrated if all target analytes with the exception of common laboratory contaminants are below their MDLs. For volatile analyses the common laboratory contaminants, methylene chloride, acetone, 2-butanone and toluene, must not exceed five (5) times their MDLs. For semi-volatile analyses the common laboratory contaminants, phthalate esters, must not exceed five (5) times their MDLs.

QC Check Sample Analyses - QC check samples may be obtained directly from EPA or prepared from suitable reference standards, but must be prepared independently of calibration standards. The QCCS usually contains the analyte(s) of interest at a concentration in the mid-calibration range. A QCCS should be analyzed if matrix spike recoveries are unacceptable to verify that the analysis is in control.

Matrix Spike/Matrix Spike Duplicate Analyses (MS/MSD) - EPA protocol requires analysis of matrix spike and matrix spike duplicate samples for each analytical batch or matrix type at a minimum frequency of five percent. The method recovery limits and RPD acceptance criteria are shown in Section V. When matrix spike recoveries fall outside limits published in the respective methods, a QCCS should be analyzed to demonstrate control. If spike recoveries are outside normal limits due to matrix problems, the data should be reported noting matrix interference.

EPA 600 series protocol requires analysis of one matrix spike at a five percent minimum frequency. These matrix spike mixtures contain all of the target compounds. A single matrix spike analysis will suffice for low level water samples where matrix effects are less likely. These recovery measurements serve as useful indicators of accuracy.

Duplicate Sample Analysis - EPA protocol recommends duplicate analysis at a five percent minimum frequency. The RPD calculated from MS/MSD analyses provides a useful assessment of precision. This approach is recommended for water samples typically having no detectable amounts of analyte.

Mass Spectrometer Sensitivity Check - If the extracted ion current profile (EICP) area for any internal standard changes by more than a factor of two (-50% - +100%), the mass spectrometer must be inspected for malfunctions and correction action taken. Samples analyzed while the system was malfunctioning must be reanalyzed; there are no exceptions.

Daily GC/MS Performance Tests - Each day that analyses are performed, the GC/MS system will be checked using bromofluorobenzene (BFB) or decafluorotriphenylphosphine (DFTPP). The acceptance criteria presented in Section V, Tables V-4 and V-5 must be met prior to performing any analyses. If all criteria are not met, the instrument will be retuned and the test repeated until all criteria are achieved; there are no exceptions.

EPA 200 Series and SW846 Metals Methods

Metals Analyses by ICPES and Atomic Absorption - The quality control protocols associates with metals analyses are described in SW846 Method 6010 (EPA Method 200.7) for ICPES and Method 7000 (EPA Methods 206.2, 270.2, 245.1, 239.1) series for atomic absorption. They include:

- Calibration verification
- Analysis of QC check samples
- Calibration blank analyses
- Reagent blank analyses
- Analysis of matrix spike/matrix spike duplicates
- Instrument check standard analyses

These procedures are described below.

Calibration - Calibration standards at two concentration levels in the instruments Linear Range are prepared by diluting stock standards. These standards must be analyzed with each batch prior to sample analysis; there are no exceptions.

QC Check Sample Analyses - Immediately after calibration, a quality control check sample (QCCS) containing all elements of interest is analyzed. The results are calculated prior to analyzing any other samples. The QC standard is purchased from a commercial source. The QCCS should be prepared in the same acid matrix as the calibration standards at the mid-calibration range.

After every ten samples, the QC standard is reanalyzed. The measured value must fall in the acceptable range published by the manufacturer. If not, the instrument must be recalibrated.

Calibration Blank (ICPES) - At a frequency of ten percent, a calibration blank is analyzed during sample analyses. As described in Method 6010, this standard is prepared by diluting 2 mL of (1+1) $HNO3$ and 10 mL of (1+1)HCl to 100 mL DI $H2O$. If response to this standard is verified to be outside three standard deviations of the mean calibration blank value, then correct the problem, recalibrate, and reanalyze the previous ten samples.

Reagent Blank - A reagent blank, containing all the reagents and in the same volumes as used in the processing of the samples and carried through the complete preparation/analysis procedure, should be analyzed at a minimum frequency of five percent, or one per sample batch. Reagent blank results should be used to correct for possible contamination resulting from varying amounts of the acids used in processing samples.

Matrix Spike/Matrix Spike Duplicate - For each analytical batch or matrix type (five percent minimum frequency), matrix spike and matrix spike duplicate samples should be analyzed. Matrix spike results should fall within the acceptable percent recovery range listed in Section V. If the spike is not recovered within the specified limits, the data should be flagged as suspect due to matrix effects. Depending on the project, provisions are established to use standard-addition analysis procedures to compensate for matrix effects.

Duplicate spiked sample results should agree within the acceptable percent RPD listed in Section V. If they do not, evaluate the system for the source of the imprecision, and correct the problem.

Total Organic Carbon

Determination of Total Organic Carbon is performed according to EPA 415.1 and 9060. Quality control measures include the following:

- Calibration
- QC Check Samples
- Method Blanks
- Matrix Spike/Matrix Spike Duplicates

These procedures are described below.

Calibration - For water samples, multiple calibrations (3) in the 0-50 ppm range are performed daily prior to sample analysis. If the calibration areas are within ten percent of one another the analysis may proceed. If not, repeat calibration. For solid samples, a one point single calibration is performed using 150 microliters of 1000 ppm carbon standard injected onto quartz wool and pyrolyzed.

QC Check Samples - QC check samples are obtained commercially (ERA and NIST) and are analyzed immediately after calibration and at the end of the analysis. The QC check sample must fall within 80 to 120 percent of the true value. If not, it must be reanalyzed. If still out of limits all samples must be reanalyzed after checking the entire system for errors. For soil samples, QC check samples are analyzed first, last, and at a minimum frequency of ten percent.

Method Blanks - Method blanks apply to water samples only, and are analyzed immediately following the first QC check sample. The result should be zero. If not, reagent blanks must be performed, the system recalibrated, and the QC check sample reanalyzed prior to re-analysis of the blank.

Matrix Spike/Matrix Spike Duplicates - Matrix spike/matrix spike duplicates are analyzed at a minimum frequency of ten percent for water samples. The acceptance limits shown in Section V must be met, otherwise the samples must be reanalyzed. Since matrix spikes are applicable to soil samples (sample size = 10 mg), all samples are analyzed in duplicate, and the precision limits listed in Section V must be met. Otherwise, the samples must be reanalyzed.

Total Organic Halogens (TOX)

Determination of TOX is performed according to EPA 9020. Quality control measures include the following:

- Test titrations
- Calibration
- Matrix spike/matrix spike duplicates

These procedures are described below.

Test Titrations - Prior to sample analysis, two test titrations must be performed. The end points must be within five millivolts of one another, and the gain readings must meet the criteria published by EPA in Method 9020. If out of limits, check the system and run duplicate test titrations until the criteria are met.

Calibration - Direct injection of known amounts of analyte to the pyrolysis tube are performed prior to sample analysis to check cell recovery. This must be performed in duplicate and the recovery must be within 80 to 120 percent for both. If out of limits, check the system and run duplicate calibrations until the criteria are met.

Matrix Spike/Matrix Spike Duplicates - Matrix spike/matrix spike duplicates are analyzed at a minimum frequency of ten percent. Both results must be within 80 to 120 percent of the true value with a 20 percent RPD maximum. Otherwise, check the system and reanalyze duplicate matrix spikes until the criteria are met. If unable to meet acceptance limits, the analysis must be redone from the beginning unless matrix interference can be cited.

Gross Alpha/Beta

Gross alpha/beta analysis is performed according to EPA 900.0. Quality control measures include the following:

- Efficiency vs. solids chart
- Background
- EC measurement
- Matrix spike/matrix spike duplicates

These procedures are described below.
Note: Samples above the MCL for alpha/beta must be recounted for verification.

Efficiency vs. Solids Chart - Prior to analyzing any samples, for each instrument an efficiency vs. solids chart must be generated as part of the initial demonstration of capability. In addition, whenever an instrument is maintained or repaired (i.e. a counting wire replaced) a new efficiency vs. solids charge must be generated. Only NBS traceable standards may be used. Samples containing solids such that the efficiency of counting drops below ten percent must be reset using a smaller aliquot so that the solids give acceptable counting efficiency.

Background - Background samples are run daily, prior to sample analysis. However, a weekly average may be used for calculation purposes.

EC Measurement - Prior to setting up a sample, an electrical conductivity measurement must be made for estimation of total dissolved solids. This estimate helps to determine the sample aliquot necessary to meet the efficiency vs. solids requirement.

Matrix Spike/Matrix Spike Duplicates - Matrix spike/matrix spike duplicates should be analyzed at a minimum frequency of ten percent. The acceptance limits shown in Section V must be met, unless matrix interference can be cited. Only NBS traceable standards may be used for spiking.

Total Radium, Natural Uranium, and Radioactive Strontium

These analytes are determined by EPA 900.1, EPA 908.0, and EPA 905.0, respectively quality control measures include the following:

- Background
- Calibration
- Matrix Spike/Matrix Spike Duplicates

These procedures are described below.

Background - Background samples are run daily prior to sample analysis, however a weekly average may be used for calculation purposes.

Calibration - One point calibration is sufficient for each batch of samples. Calibration factors are stable over time if no instrument parameters have changed. If the calibration factor differs from the running average by more than 20 percent, check the instrument and recount the standard or prepare new standard and recount. Only NBS traceable standards may be used.

Matrix Spike/Matrix Spike Duplicates - Matrix spike/matrix spike duplicates should be analyzed at a minimum frequency of ten percent. The acceptance limits listed in Section V must be met unless matrix interference can be cited. Only NBS traceable standards may be used.

:adon-222 and Tritium

These analytes are determined by EPA 913.0 and 906.0, respectively. Quality control measures include the following:

- Background
- Calibration
- Duplicate Analyses

These procedures are described below.

Background - Background samples must be run daily prior to sample analysis. Background are generally stable overtime, and must be below or less than ten percent above the historical average. If our of limits, the entire system must be checked for errors and contamination. The background requirements must be met, otherwise sample analysis cannot proceed.

Calibration - Three point calibration is required using NBS Traceable Standards only. Calibration factors must be within twenty percent Relative Standard Deviation. The calibration requirements must be met, otherwise sample analysis cannot proceed. If out of limits, the entire system must be checked for errors and contamination.

Duplicate Analyses - Duplicate analyses must be performed at a minimum frequency of ten percent. The limits listed in Section V must be met for tritium if the duplicate contains detectable amounts of tritium. Radon samples are field duplicates which may not meet the limits listed in Section V, however "poor duplication" must be cited on the report if the limits are not met.

Titrimetric Determination of Alkalinity

Titrimetric determination of alkalinity is performed according to EPA Method 310.1. Quality control procedures include the following:

- Titrant Standardization
- Laboratory Control Sample
- Duplicate Analyses

Titrant Standardization - The sulfuric Acid titrant is standardized against sodium carbonate.

Laboratory Control Sample Analyses - Alkalinity QC check standard is analyzed daily. Recovery within EPA stated limits is required for analyses to proceed.

Duplicate Analyses - A duplicate analysis is analyzed every ten samples. The duplicate analysis should include all sample preparation steps. Precision should be within twenty percent RPD, or +/-2 detection limits.

olorimetric Determination of Phosphate

Sample will be analyzed for EPA Method 365.2. Quality control procedures include the following:

- Calibration coefficient
- Analysis of Laboratory Control Samples
- Analysis of matrix spike/matrix spike duplicates

Calibration - A calibration curve is prepared daily, with verification.

Laboratory Control Sample Analyses - Analyze a laboratory control sample immediately after calibration. Recovery should be within ERA stated limits for analysis to proceed.

Matrix Spike/Matrix Spike Duplicates - For every sample matrix analyzed (minimum ten percent frequency), verification is required to ensure that chemical interference is not affecting color development. The spike recovery should be between 80 to 120 percent. Samples that suffer from matrix interferences shall be diluted and reanalyzed.

Cyanide Analyses

Inorganic cyanide will be determined colorimetrically according to EPA Method 335.2 and SW846 Method 9010. Quality control procedures include:

- Calibration Verification
- Method Blank Analyses
- Analyses of Laboratory Control Samples
- Duplicate Analyses
- Analyses of Matrix Spiked Samples

Calibration - Calibration procedures are described in Section V. A calibration curve is prepared daily, with verification.

Method Blank Analyses - A minimum of one reagent blank per sample batch will be analyzed to determine if contamination or memory effects have occurred.

Laboratory Control Sample Analyses - A QC check sample, prepared independently of calibration standards, is analyzed daily. Recovery should be within ERA stated limits for analysis to proceed.

Duplicate Analyses - A duplicate analysis or matrix spike duplicate analysis should be run every ten samples. The duplicate run includes the whole sample preparation and analytical process. Precision should be within 20 percent RPD or +/-2 detection limits.

Matrix Spike Analyses - For each batch or matrix type (up to 20 samples), an aliquot of sample should be spiked and analyzed. Recovery of the spike should be within 25 percent of the amount added.

Fluoride Analyses

Fluoride analyses will be performed according to EPA Method 340.2. Quality control procedures include:

- Multipoint calibration
- Analyses of QC Check Samples
- Duplicate Analyses
- Analyses of Matrix Spiked Samples

Calibration - Calibration procedures are described in Section V. The method specified a daily multipoint calibration with verification.

Laboratory Control Sample Analyses - A QC check sample, prepared independently of calibration standards, should be analyzed daily. Recovery should be within ERA stated limits for analysis to proceed.

Duplicate Analyses - A duplicate analysis or matrix duplicate analysis should be run every ten samples. The duplicate run should include the whole sample preparation and analytical process. Precision should be within 20 percent RPD, or +/-1 detection limit.

Matrix Spike Analyses - For each batch or matrix type (minimum of ten percent), an aliquot of sample should be spiked and analyzed. Recovery of the spike should be within 20 percent of the amount added.

Turbidimetric Determination of Sulfate

Turbidimetric determination of sulfate is performed according to EPA Method 375.4 or SW846 Method 9038. Quality control procedures include the following:

- Multipoint Calibration
- QC Check Sample Analyses
- Duplicate Analyses
- Matrix Spike Analyses

Multipoint Calibration - A multipoint calibration curve will be prepared daily, as described in Section V.

Laboratory Control Sample Analyses - A sulfate QC check standard is analyzed daily. Recovery should be within ERA stated limits for analyses to proceed.

Duplicate Analyses - A duplicate analysis (or matrix spike duplicate) is analyzed every 10 samples. The duplicate analysis should include all sample preparation steps. Precision should be within 20 percent RPD, +/-1 detection limit.

Matrix Spike Analyses - For each batch of samples of a matrix type (20 maximum), an aliquot of sample will be spiked and analyzed. Recovery of the spike should be within 20 percent of the expected value; if not, the data will be flagged.

'aste Extraction Test

The waste extraction test will be performed according to procedures described in the California Administrative Code, Section 66700. Quality control procedures include:

- Method Blank Analyses
- Duplicate Extractions

Method Blank Analyses - A minimum of one reagent blank per sample batch will be analyzed to determine if contamination or memory effects have occurred.

Duplicate Extractions - A duplicate extraction will be performed with every batch of samples, at a minimum frequency of ten percent. Results for analyses of the duplicate extracts will be used to estimate overall measurement variability.

TABLE VI-1

SUMMARY OF CALIBRATION AND INTERNAL QUALITY CONTROL PROCEDURES FOR REPRESENTATIVE WET CHEMISTRY ANALYSES

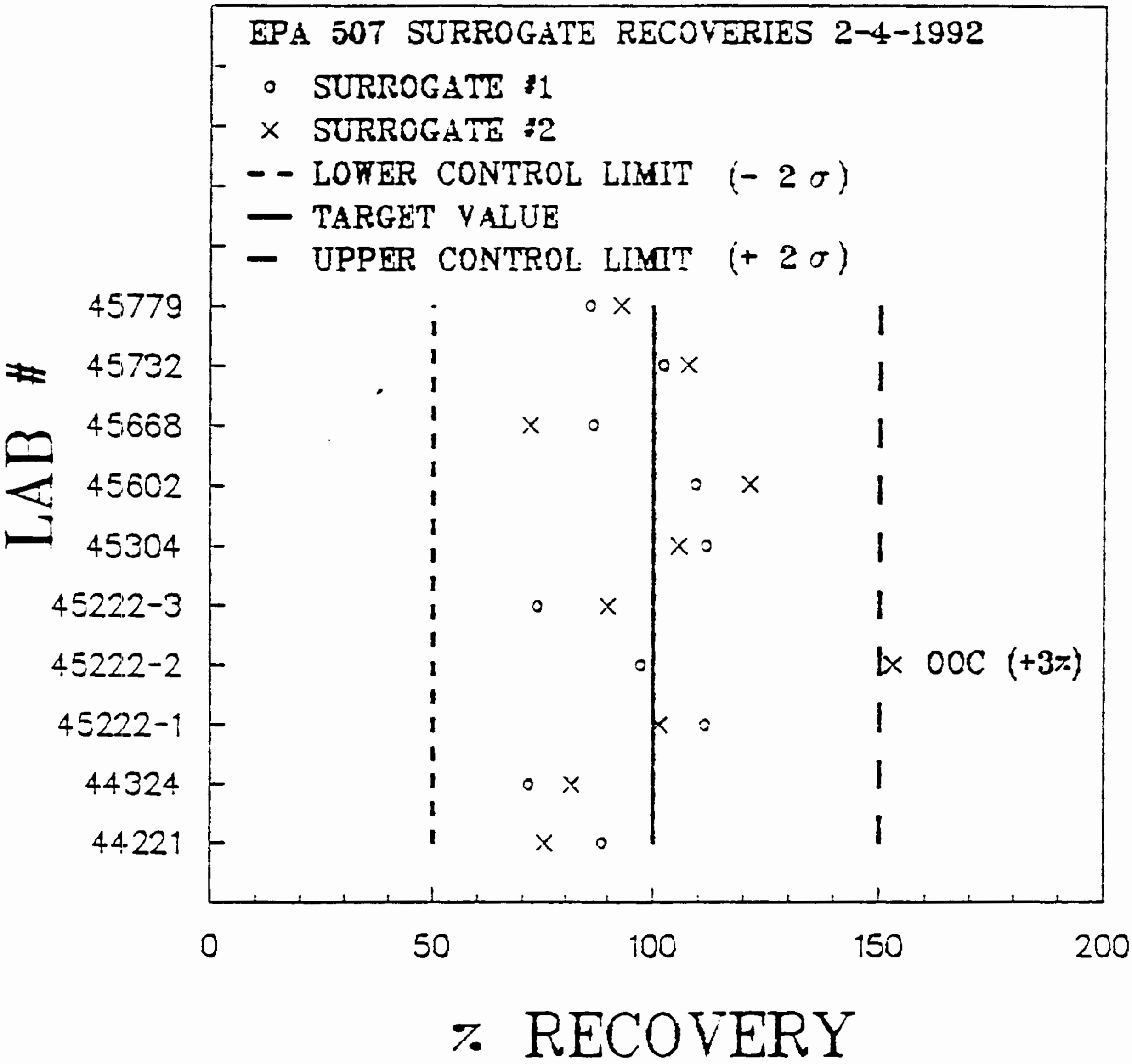
Parameter	Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Conductane (aqueous)	120.1	Single-point calibration	Prior to sample analyses	Measured value within + -2% of true value	1. Repeat calibration 2. See instrument manual
		QC Sample and after every 20 samples (minimum) two per set)	After calibration	Measured value within +10% of true value	1. Repeat check 2. Repeat calibration and check
		Duplicate analysis	5%	Coefficient of variation (CV) $\leq$ 10%	Obtain third value
Hardness	130.2	QC check sample	One per batch	+10%	1. Evaluate system 2. Repeat calibration
		Duplicate Spike	10% 10%	RPD $\leq$20%	1. Obtain third value 2. Flag data
pH (aqueous)	150.1	Two-point calibration	Daily prior to sample analyses	Reading within 0.05 pH units of buffer solution values	1. Repeat calibration 2. See instrument manual
		QC Sample	After calibration	Analysis within 0.2 pH units of true value	1. Repeat check 2. Repeat calibration and check
		Duplicate analysis	10%	Coefficient of variation (CV) $\leq$1%	Obtain third value

TABLE VI-1

SUMMARY OF CALIBRATION AND INTERNAL QUALITY CONTROL PROCEDURES (continued)

Parameter	Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
TDS	160.1	QC check sample	One per batch	-10% recovery	Reanalyze samples
		Duplicate analysis	10%	RPD 20%	1. Obtain third value 2. Flag data
TSS	160.2	QC check sample	One per batch	+10% recovery	Reanalyze samples
		Duplicate analysis	10%	RPD 20%	1. Obtain third value 2. Flag data
Turbidity	180.1	Duplicate	10%	+ ≤20 RPD	1. Obtain third value 2. Flag data
Nitrate-N Ammonia-N	353.1 350.1	QC check sample	10%	ERA Values	1. Evaluate system 2. Repeat calibration
		Duplicate analysis	10%	RPD 20%	1. Obtain third value 2. Flag data
		Spike	10%	±20%	1. Flag data
		Blank	Daily	<0.04 mg/L	
		Calibration	Daily	Corr. Coef. ≥0.995	

FGL CONTROL CHART



NOTE : OOC = OUT OF CONTROL

FIGURE VI-2

QUALITY CONTROL INSPECTION REPORT

Date: ____________________

Time: ____________________

LAB	QUALITY CONTROL DEFICIENCIES OBSERVED	RECOMMENDATIONS CORRECTIONS

Inspector's Signature: ____________________

Corporate Offices & Laboratory
P. O. Box 272 / 853 Corporation St.
Santa Paula CA 93061
TEL: (805) 659-0910 or 525-3824
FAX: (805) 525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton CA 95205
TEL: (209) 942-0181
FAX: (209) 942-0423

Field Office
Visalia California 93277
TEL: (209) 734-9473
Mobile: (209) 738-6273

VII. Preventative Maintenance

A). Maintenance and Repair of Instruments

Routine maintenance of equipment is performed by the analyst when appropriate. Instrument maintenance and calibration is performed by qualified service technicians (usually service representatives of the instrument manufacturer). Instrument repair is also performed by these technicians and a record (containing the date, the nature of the problem, description of the repair, and the name of the technician) is also kept.

B). Good Laboratory Practices

Good laboratory practices are followed to prevent contamination of samples and standards. This includes the careful cleaning of glassware, and the use of disposable labware and containers when practical. Sample containers are monitored for contamination when received according to lot number and proposed use.

The deionized water is monitored by an automatic shut-off valve (at a set resistance of 500,000 ohms), checked monthly for pH, standard plate count, electrical conductivity, total dissolved solids, residual chlorine, and heavy metals (to include lead, cadmium, chromium, copper, nickel and zinc).

The analytical balances are certified once a year by a qualified specialist, and checked weekly using standard S weights.

All refrigerator, oven, and incubator temperatures are monitored daily, and all thermometers are checked for accuracy on a quarterly basis.

Fumehood velocities are checked monthly and sash marks are adjusted if necessary according to CAL OSHA regulations.

The pH meter is to be standardized on the day of use with two (2) buffer solutions (pH 4, 7 and/or 10).

The conductivity meter is to be standardized once a month with 0.01 N KCl solution.

The turbidity meter is to be standardized with standards before use. Standards are replaced yearly and checked with EPA check samples or equivalent commercial check samples.

The QA/QC Director must be notified immediately if any sign of malfunction occurs in any instrument so that he can decide if a qualified serviceman should be consulted.

In accordance with current regulations, hazardous materials are clearly labeled and Material Data Safety Sheets are available for employee inspection.

C. Performance and System Audits

Quality Control Inspections will be conducted quarterly. Quality Control spot checks are conducted weekly. Quality control spot check/inspection reports are kept on file in the QA Directors office. Photocopies of these reports are distributed to lab managers immediately following the inspections/spot checks. Corrective actions are expected to be implemented within 30 days of the inspection/spot check. Semi-annually, FGL, Inc. participates in EPA Performance Evaluation Studies and/or EPA inter laboratory comparison studies. FGL also conducts annual double-blind performance studies through environmental resource associates.

VIII. Data Reduction, Validation and Reporting

Before reporting, all data is qualified as being acceptable according to Internal Quality Control requirements (e.g. acceptance limits, holding times, preservation, etc....).

IX. Corrective Action in Out-of-Control Situations

The results obtained from the duplicate and the spiked samples should be within the acceptance limits. In the event of an out-of-control situation, the following (in order) should be investigated:

1). Check for errors in calculation
2). Check calibration and instrument performance. Prepare new standards if necessary.
3). Reanalyze, if possible, the duplicate or spiked sample. (prepare a new spiked sample if necessary).

If there is insufficient sample for re-analysis, an alternate sample from the set may be analyzed as either a duplicate or a spiked sample.

If an instrument is not functioning properly, immediately notify the QA Director. If unavailable, then notify the lab manager. If neither are available, then post a notice on the instrument indicating "out of order" condition, and continue working with other instruments known to be functioning properly. Notify the QA Director as soon as possible.

Each work area has a corrective actions notebook. When corrective actions are necessary, an entry is made to the notebook identifying the problem, method, the analyst, and proposed corrective actions. After implementing the actions another entry is required to verify that the problem was solved. This process may need to be repeated in some situations. If matrix interference is the cause for the out of control situation the data may be reported with the appropriate explanation, and results reported as "estimated concentration".

X. Safety

FGL has a progressive safety program which meets all OSHA requirements, as well as those of Senate Bill #198. At all times FGL has the following materials readily available to it's employees:

- Material Safety Data Sheets
- OSHA Laboratory Standard Regulations
- FGL Emergency Action Plan
- FGL Chemical Hygiene Plan
- FGL Fire Prevention Plan
- FGL Hazard Communication Plan
- FGL Injury and Illness Prevention Plan

The above materials are available to outside parties upon request.

FGL holds monthly safety inspections and quarterly safety training sessions and safety committee meetings. At FGL, quality and safety go hand-in-hand.

STATE OF CALIFORNIA—HEALTH AND WELFARE AGENCY PETE WILSON, Governor

DEPARTMENT OF HEALTH SERVICES
2151 BERKELEY WAY
BERKELEY, CA 94704-1011

(510)540-2800

May 13, 1992

Mr. Darrell Nelson
FGL Environmental
P.O. Box 272
Santa Paula, CA 93061

Certificate No.: 1573

Dear Mr. Nelson:

Enclosed is an updated copy of your ELAP Fields of Testing List. If you have any questions, please contact our office at (510) 540-2800.

Sincerely,

William R. Ray
Water/wastewater Laboratory Consultant
Environmental Laboratory
Accreditation Program

Enclosure

ENVIRONMENTAL LABORATORY ACCREDITATION/REGISTRATION
List of Approved Fields of Testing and Analytes

FGL Environmental/Santa Paula
853 Corporation Street
Santa Paula, CA 93060

PHONE: (805) 659-0910
COUNTY: Ventura

LABORATORY CATEGORY: Commercial
CERTIFICATE NUMBER: 1573

1.0 Microbiology of Drinking Water and Wastewater ---(07-15-91)
1.1 Total Coliforms by Multiple Tube Fermentation -----Y
1.2 Fecal Coliforms by Multiple Tube Fermentation -----Y
1.3 Total Coliforms by Membrane Filter ---N
1.4 Fecal Coliforms by Membrane Filter ---N
1.5 Heterotrophic Plate Count ---Y
1.6 Total Coliforms by MMO-MUG Drinking Water Only--N
1.7 Fecal Coliforms by MMO-MUG Drinking Water Only--N

2.0 Inorganic Chemistry and Physical Properties of Drinking Water excluding Toxic Chemical Elements ---(07-15-91)
2.1 Alkalinity ---Y
2.2 Calcium ---Y
2.3 Chloride ---Y
2.4 Corrosivity ---Y
2.5 Fluoride ---Y
2.6 Hardness ---Y
2.7 Magnesium ---Y
2.8 MBAS ---Y
2.9 Nitrate ---Y
2.10 Nitrite ---Y
2.11 Sodium ---Y
2.12 Sulfate ---Y
2.13 Total Filterable Residue and Conductivity ---Y
2.14 Iron (Colorimetric Only) ---N
2.15 Manganese (Colorimetric Only) ---N

3.0 Analysis of Toxic Chemical Elements in Drinking Water ---(07-15-91)
3.1 Arsenic ---Y
3.2 Barium ---Y
3.3 Cadmium ---Y
3.4 Chromium, total ---Y
3.5 Copper ---Y
3.6 Iron ---Y
3.7 Lead ---Y
3.8 Manganese ---Y
3.9 Mercury ---Y
3.10 Selenium ---Y
3.11 Silver ---Y
3.12 Zinc ---Y
3.13 Aluminum ---Y
3.14 Asbestos ---N

4.0 Organic Chemistry of Drinking Water (measurement by GC/MS combination) ---(07-15-91)
4.1 Volatile Organics ---Y
4.2 Trihalomethanes ---N
4.3 Acid and Base/Neutral Compounds ---Y

5.0 Organic Chemistry of Drinking Water (excluding measurements by GC/MS combination) ---(07-15-91)
5.1 Total Trihalomethanes ---Y
5.2 Chlorinated pesticides ---Y
5.3 Chlorophenoxy herbicides ---Y
5.4 Halogenated Volatiles ---N
5.5 Aromatic Volatiles ---N
5.6 EDB and DBCP ---Y
5.7 Polychlorinated Biphenyls ---Y
5.8 Carbamates ---Y
5.9 Nitrogen/Phosphorus Pesticides---Y
5.10 Glyphosate ---Y

6.0 Radiochemistry ---(07-15-91)
6.1 Gross alpha and beta and counting error ---Y
6.2 Total Radium ---Y
6.3 Radium 226 ---N
6.4 Uranium ---Y
6.5 Radon 222 ---Y
6.6 Radioactive Cesium ---N
6.7 Iodine 131 ---N
6.8 Radioactive Strontium ---Y
6.9 Tritium ---Y
6.10 Gamma emitting Isotopes ---N
6.11 Gross Alpha by Co-precipitation ---N

7.0 Shellfish Sanitation ---(------)
7.1 Shellfish meat Microbiology ---N
7.2 Paralytic Shellfish Poison ---N

8.0 Aquatic Toxicity Bioassays ---(------)
8.1 All Fresh Water: Static, Static/Renewal and Continuous Flow Bioassays; and Estuarine/Marine: Static, Static/Renewal, and Continuous Flow Bioassays ---N
8.2 Hazardous wastes Section 66696 (a) (4) ---N

9.0 Physical Properties Testing of Hazardous Waste ---(07-15-91)
9.1 Ignitability (Flashpoint determination Section 66702) ---Y

9.2 Corrosivity - pH determination ---------- Y
9.3 Corrosivity - Corrosivity towards steel (Section 66708) ---------- N
9.4 Reactivity (Section 66705) ---------- Y

10.0 Inorganic Chemistry and Toxic Chemical Elements of Hazardous Waste
10.1 Antimony ---------- 6010(07-15-91) ---------- 7041(06-06-86) ---------- Y
10.2 Arsenic ---------- 7060(06-06-86) ---------- Y
10.3 Barium ---------- 6010(06-06-86) ---------- Y
10.4 Beryllium ---------- 6010(06-06-86) ---------- Y
10.5 Cadmium ---------- 6010(07-15-91) ---------- 7130(06-06-86) 7131(06-06-86) ---------- Y
10.6 Chromium, total ---------- 6010(07-15-91) ---------- 7190(06-06-86) ---------- Y
10.7 Cobalt ---------- 6010(06-06-86) ---------- Y
10.8 Copper ---------- 6010(07-15-91) ---------- 7210(06-06-86) ---------- Y
10.9 Lead ---------- 6010(07-15-91) ---------- 7420(06-06-86) 7421(06-06-86) ---------- Y
10.10 Mercury ---------- 7470(06-06-86) ---------- Y
10.11 Molybdenum ---------- 6010(06-06-86) ---------- Y
10.12 Nickel ---------- 6010(07-15-91) ---------- 7520(06-06-86) ---------- Y
10.13 Selenium ---------- 7740(06-06-86) ---------- Y
10.14 Silver ---------- 6010(07-15-91) ---------- 7760(06-06-86) ---------- Y
10.15 Thallium ---------- 6010(07-15-91) ---------- 7841(06-06-86) ---------- Y
10.16 Vanadium ---------- 6010(06-06-86) ---------- Y
10.17 Zinc ---------- 6010(07-15-91) ---------- 7950(06-06-86) ---------- Y
10.18 Chromium (VI) ---------- 7196(06-06-86) ---------- Y
10.19 Cyanide ---------- 9010(06-06-86) ---------- Y
10.20 Fluoride ---------- 340.1(07-15-91) 340.2(06-06-86) ---------- Y
10.21 Sulfide ---------- 9030(06-06-86) ---------- Y
10.22 Total Organic Lead ---------- (07-13-88) ---------- Y

11.0 Extraction Tests of Hazardous Waste ---------- (06-06-86)
11.1 Section 66700 (WET) ---------- Y
11.2 Extraction Procedure Toxicity ---------- Y
11.3 Toxicity Characteristic Leaching Procedure (TCLP) ---------- Y

12.0 Organic Chemistry of Hazardous Waste (measurement by GC/MS combination)
12.1 Volatile compounds ---------- 8240(02-05-87) ---------- Y
12.2 Semivolatile compounds ---------- 8270(05-02-87) ---------- Y

13.0 Organic Chemistry of Hazardous Waste (excluding measurements by GC/MS combination)
13.1 Halogenated Volatiles ---------- N
13.2 Non-Halogenated Volatiles ---------- 8015(01-09-90) ---------- Y
13.3 Aromatic Volatiles ---------- 8020(06-06-86) ---------- Y
13.4 Acrolein, Acrylonitrile, Acetonitrile ---------- N
13.5 Phenols ---------- 8040(06-06-86) ---------- Y
13.6 Phthalate Esters ---------- N
13.7 Organochlorine Pesticides ---------- 8080(06-06-86) ---------- Y
13.8 Polychlorinated Biphenyls (PCBs) ---------- 8080(06-06-86) ---------- Y
13.9 Nitroaromatics and Cyclic Ketones ---------- N
13.10 Polynuclear Aromatic Hydrocarbons ---------- 8100(06-06-86) ---------- Y
13.11 Chlorinated Hydrocarbons ---------- 8120(06-06-86) ---------- Y
13.12 Organophosphorus Pesticides ---------- 8140(06-06-86) ---------- Y
13.13 Chlorinated Herbicides ---------- 8150(06-06-86) ---------- Y
13.14 Carbamates ---------- 632(07-15-91) ---------- Y
13.15 Total Petroleum Hydrocarbons ---------- (11-08-87) ---------- Y

14.0 Bulk Asbestos Analysis ---------- (--------)
14.1 Section 66699 (1% or greater asbestos concentrations) ---------- N

15.0 Substances Regulated Under the California Safe Drinking Water and Toxic Enforcement Act
(Proposition 65) and Not Included in Other listed Groups. ---------- N

16.0 Wastewater Inorganic Chemistry, Nutrients and Demand ---------- (07-15-9[illegible]

16.1	Acidity	Y
16.2	Alkalinity	Y
16.3	Ammonia	Y
16.4	Biochemical Oxygen Demand	Y
16.5	Boron	Y
16.6	Bromide	Y
16.7	Calcium	Y
16.8	cBOD	N
16.9	Chemical Oxygen Demand	Y
16.10	Chloride	Y
16.11	Chlorine Residual, total	Y
16.12	Cyanide	Y
16.13	Cyanide amenable to Chlorination	N
16.14	Fluoride	Y
16.15	Hardness	Y
16.16	Kjeldahl Nitrogen	Y
16.17	Magnesium	Y
16.18	Nitrate	Y
16.19	Nitrite	Y
16.20	Oil and Grease	Y
16.21	Organic Carbon	Y
16.22	Oxygen, Dissolved	Y
16.23	pH	[illegible]
16.24	Phenols	[illegible]
16.25	Phosphate, ortho-	[illegible]
16.26	Phosphorus, total	[illegible]
16.27	Potassium	[illegible]
16.28	Residue, Total	[illegible]
16.29	Residue, Filterable (TDS)	[illegible]
16.30	Residue, Nonfilterable (TSS)	[illegible]
16.31	Residue, Settleable (SS)	[illegible]
16.32	Residue, Volatile	[illegible]
16.33	Silica	[illegible]
16.34	Sodium	[illegible]
16.35	Specific Conductance	[illegible]
16.36	Sulfate	[illegible]
16.37	Sulfide (includes total and soluble)	[illegible]
16.38	Sulfite	[illegible]
16.39	Surfactants (MBAS)	[illegible]
16.40	Tannin and Lignin	[illegible]
16.41	Turbidity	[illegible]
16.42	Iron (Colorimetric Only)	[illegible]
16.43	Manganese (Colorimetric Only)	[illegible]
16.44	TRPH	[illegible]
16.45	TOX	[illegible]

17.0 Toxic Chemical Elements in Wastewater ---------- (07-15-9[illegible]

17.1	Aluminum	Y
17.2	Antimony	Y
17.3	Arsenic	Y
17.4	Barium	Y
17.5	Beryllium	Y
17.6	Cadmium	Y
17.7	Chromium (VI)	Y
17.8	Chromium, total	Y
17.9	Cobalt	Y
17.10	Copper	Y
17.11	Gold	Y
17.12	Iridium	N
17.13	Iron	Y
17.14	Lead	Y
17.15	Manganese	Y
17.16	Mercury	Y
17.17	Molybdenum	[illegible]
17.18	Nickel	[illegible]
17.19	Osmium	[illegible]
17.20	Palladium	[illegible]
17.21	Platinum	[illegible]
17.22	Rhodium	[illegible]
17.23	Ruthenium	[illegible]
17.24	Selenium	[illegible]
17.25	Silver	[illegible]
17.26	Strontium	[illegible]
17.27	Thallium	[illegible]
17.28	Tin	[illegible]
17.29	Titanium	N
17.30	Vanadium	[illegible]
17.31	Zinc	[illegible]

18.0 Organic Chemistry of Wastewater (measurements by GC/MS combination) ---------- (07-15-9[illegible]

18.1	Volatile Organics	[illegible]
18.2	Acid and Base/Neutral compounds	[illegible]

19.0 Organic Chemistry of Wastewater (excluding measurements by GC/MS combination) ---------- (07-15-9[illegible]

19.1	Halogenated Volatiles	N
19.2	Aromatic Volatiles	Y
19.3	Acrolein, Acrylonitrile, Acetonitrile	N
19.4	Phenols	Y
19.5	Benzidine	N
19.6	Phthalate Esters	N
19.7	Nitrosoamines	N
19.8	Organochlorine Pesticides	[illegible]
19.9	Polychlorinated Biphenyls	[illegible]
19.10	Nitroaromatics and Cyclic Ketones	N
19.11	Polynuclear Aromatics	[illegible]
19.12	Haloethers	N
19.13	Carbamates	[illegible]
19.99	Chlorinated Herbicides	[illegible]

This laboratory is also certified for additional hazardous material test categories under Certificate No. _______.

This laboratory is also certified for additional drinking water test categories under Certificate No. _______.

APPENDIX F

BLANK, DUPLICATE, AND SPIKE SAMPLE ANALYTICAL REPORTS

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses   Lab # SP 300450

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300450-01	201A	MW5/B/18/1A	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300450-02	201A	MW6/B/18/1A	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2   Containers: (a) Amber Glass TFE-Cap   ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental

Steve Castellano

for Darrell H. Nelson, B.S.
Laboratory Director

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300450

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930202 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300450-01	201A	MW5/C/18/1A	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300450-02	201A	MW6/C/18/1A	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

FGL Environmental

H. Neal Hutchison, B.S.
Organic Laboratory Manager

for Darrell H. Nelson, B.S.
Laboratory Director

rporate Offices & Laboratory
O. Box 272 / 853 Corporation Street
nta Paula, CA 93061-0272
L (805) 659-0910

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215

Field Office
Visalia, California
TEL: (209) 734-9473

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300450-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW5/0/18/1A
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300450-1
Description: MW5/0/18/1A

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	83	61-164	86
Toluene-d8	81-117	102	81-117	96
BFB	62-124	100	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

February 4, 1993

LAB No: SP 300450-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW6/0/18/1A
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300450-2
Description: MW6/0/18/1A

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	84	61-164	86
Toluene-d8	81-117	97	81-117	96
BFB	62-124	96	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

QA/QC ID# 930202 TOC-201A

RE: Organic Analysis

Extracted: N/A
Analyzed : February 2, 1993

FGL Environmental Quality Assurance Report

TOC METHOD

CONSTITUENT		CONC. SPIKED mg/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
TOC	415.1	90.0	104	103	80-120	1.0	20.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

QA/QC ID# 930203 TOC-201A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: N/A
Analyzed : February 3, 1993

FGL Environmental Quality Assurance Report

TOC METHOD

CONSTITUENT		CONC. SPIKED mg/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
TOC	415.1	20.0	94	93	80-120	1.0	20.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 5, 1993

QA/QC ID# 930203 TOX-201A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: N/A
Analyzed : February 3, 1993

FGL Environmental Quality Assurance Report

TOX METHOD

CONSTITUENT		CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
TOX	9020	110.0	97	94	80-120	3.0	20.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 5, 1993

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

QA/QC ID# 930204 TOX-201A

RE: Organic Analysis

Extracted: N/A
Analyzed : February 4, 1993

FGL Environmental Quality Assurance Report

TOX METHOD

CONSTITUENT		CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
TOX	9020	110.0	97	105	80-120	7.0	20.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

QA/QC ID# 930201 608-202A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: February 1, 1993
Analyzed : February 4, 1993

FGL Environmental Quality Assurance Report

EPA METHOD 608

CONSTITUENT	CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
Aldrin	0.3	128	136	31-146	6.0	30.0
Dieldrin	1.3	110	116	55-139	6.0	80.0
Endrin	1.3	118	125	54-163	6.0	30.0
Heptachlor	0.3	111	121	39-170	9.0	30.0
Lindane	0.3	103	109	37-145	7.0	30.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

QA/QC DATA*

Sample I.D.	Compound & EPA Method	Duplicate 1	Duplicate 2	Relative % Difference	LCS % Recovery
MW2	Nitrate 352.2	103	108	4	102
MW3	Fluoride 340.2	106	108	1	101
MW9	Sulfate 300.0	96	94	3	96
MW9	Chloride 300.0	104	98	6	96
MW10	Ortho-P 365.2	99	108	8	106

Sample I.D.	EC EPA Method	Duplicate 1	Duplicate 2	Relative % Difference	LCS % Recovery
MW2	120.1	4170	4160	0.2	101
MW5		4170	4170	0.2	101
MW7		775	775	0	101
MW9		2770	2770	0	101
MW10		635	635	0	101

Sample I.D.	pH EPA Method	Duplicate 1	Duplicate 2	Relative % Difference	LCS % Recovery
MW1	150.1	7.7	7.7	0	101
MW5		7.8	7.9	1	101
MW7		7.4	7.4	0	101
MW8		7.1	7.1	0	101

*For Lab No.'s: 300423, 300439, 300440, 300441, 300443, 300444, 300445, 300449

Very truly yours,
FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano, M.S.
Quality Assurance Director

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

QA/QC ID# 930201 615-205A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: February 1, 1993
Analyzed : February 1, 1993

FGL Environmental Quality Assurance Report

EPA METHOD 615

CONSTITUENT	CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
2,4-D	1.0	79	59	30-150	28.0	30.0
2,4-DB	1.0	76	28	30-150	92.0 *	30.0
2,4,5-T	1.0	62	36	30-150	52.0 *	30.0
2,4,5-TP (Silvex)	1.0	89	58	30-150	42.0 *	30.0
Bentazon	1.0	116	116	30-150	0.0	30.0
Dalapon	1.0	113	132	30-150	15.0	30.0
Dichloroprop	1.0	90	59	30-150	42.0 *	30.0
Dinoseb	1.0	67	57	30-150	17.0	30.0
Pentachlorophenol	0.5	113	135	30-150	18.0	30.0
Picloram	1.0	90	89	30-150	1.0	30.0
SURROGATE						
2,4-DCAA	2.0	202 *	96	30-150		

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

* Percent recovery and/or percent difference is above acceptance limit, however, all other QC criteria were met.

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

QA/QC ID# 930203 624-202A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: N/A
Analyzed : February 3, 1993

FGL Environmental Quality Assurance Report

EPA METHOD 624

CONSTITUENT	CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
Benzene	10.0	91	115	53-150	23.0*	19.0
Chlorobenzene	10.0	90	113	61-146	23.0*	17.0
1,1-Dichloroethylene	10.0	84	93	28-160	10.0	54.0
Toluene	10.0	97	122	64-132	23.0*	20.0
Trichloroethylene	10.0	95	121	61-140	24.0*	20.0

MS = Matrix Spike
AR = Acceptable Range
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
Matrix = Laboratory Blank Water
MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

*Percent difference is above acceptance range; however, all other QC criteria were met.

FGL ENVIRONMENTAL
ANALYTICAL CHEMISTS

February 9, 1993

QA/QC ID# 930203 625-201A

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis

Extracted: February 3, 1993
Analyzed : February 3, 1993

FGL Environmental Quality Assurance Report

EPA METHOD 625

CONSTITUENT	CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
Acenaphthene	100.0	73	78	29-111	7.0	30.0
1,4-Dichlorobenzene	100.0	61	66	15-101	8.0	30.0
2,4-Dinitrotoluene	100.0	62	67	38-102	8.0	30.0
N-Nitrosodi-N-propylamine	100.0	24	25	D-107	4.0	50.0
Pyrene	100.0	95	100	44-114	5.0	30.0
1,2,4-Trichlorobenzene	100.0	61	67	18-109	9.0	30.0
2-Chlorophenol	133.0	63	70	51- 96	11.0	30.0
4-Nitrophenol	133.0	4	6	D- 59	50.0	50.0
p-Chloro-m-cresol	133.0	66	71	26-146	7.0	50.0
Pentachlorophenol	133.0	69	78	21- 90	12.0	50.0
Phenol	133.0	29	33	D-106	13.0	50.0
SURROGATES						
2-Fluorobiphenyl	133.0	48	55	34-99		
Nitrobenzene-d5	133.0	68	72	37-94		
p-Terphenyl-d14	133.0	92	93	57-94		
2-Fluorophenol	133.0	74	77	12-82		
Phenol-d6	133.0	28	32	23-62		
2,4,6-Tribromophenol	133.0	75	77	49-102		

MS = Matrix Spike MSD = Matrix Spike Duplicate Matrix = Laboratory Blank Water
AR = Acceptable Range RPD = Relative Percent Difference MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 9, 1993

QA/QC ID# 930201 625-201A

Bermite Division of Whittaker
22116 West Soledad Canyon Road
Saugus, California 91350

RE: Organic Analysis

Extracted: February 1, 1993
Analyzed : February 3, 1993

FGL Environmental Quality Assurance Report

EPA METHOD 625

CONSTITUENT	CONC. SPIKED ug/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
Acenaphthene	100.0	90	84	29-111	7.0	30.0
1,4-Dichlorobenzene	100.0	77	61	15-101	5.0	30.0
2,4-Dinitrotoluene	100.0	128*	124*	38-102	3.0	30.0
N-Nitrosodi-N-propylamine	100.0	18	24	D-107	29.0	50.0
Pyrene	100.0	88	90	44-114	2.0	30.0
1,2,4-Trichlorobenzene	100.0	70	63	18-109	11.0	30.0
2-Chlorophenol	133.0	77	69	51- 96	11.0	30.0
4-Nitrophenol	133.0	D	D	D- 59	N/A	50.0
p-Chloro-m-cresol	133.0	79	82	26-146	4.0	50.0
Pentachlorophenol	133.0	64	62	21- 90	3.0	50.0
Phenol	133.0	58	63	D-106	8.0	50.0
SURROGATES						
2-Fluorobiphenyl	133.0	84	74	34-99		
Nitrobenzene-d5	133.0	67	68	37-94		
p-Terphenyl-d14	133.0	65	72	57-94		
2-Fluorophenol	133.0	61	67	12-82		
Phenol-d6	133.0	73*	65*	23-62		
2,4,6-Tribromophenol	133.0	85	77	49-102		

MS = Matrix Spike MSD = Matrix Spike Duplicate Matrix = Laboratory Blank Water
AR = Acceptable Range RPD = Relative Percent Difference MAV = Maximum Acceptable Value

*Percent recovery is above acceptance range; however, all other QC criteria were met.

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

February 10, 1993

QA/QC ID# 930208

Bermite Division of Whittaker
22116 West Soledad Canyon Road
Saugus, California 91350

RE: Radioactivity Analyses

Date Setup: February 2, 1993
Analyzed : February 8, 1993

FGL Environmental Quality Assurance Report

RADIOACTIVITY

CONSTITUENT	CONC. SPIKED pCi/L	ACCURACY % RECOVERED MS	MSD	AR	PRECISION % DIFFERENCE RPD	MAV
Gross Alpha	115	77	96	75-125	22*	20.0
Gross Beta	435	121	119	75-125	2	20.0

MS = Matrix Spike MSD = Matrix Spike Duplicate Matrix = Laboratory Blank Water
AR = Acceptable Range RPD = Relative Percent Difference MAV = Maximum Acceptable Value

FGL ENVIRONMENTAL

Steve Castellano

Steve Castellano
Quality Assurance Director

*Percent difference is above acceptance range; however, all other QC criteria were met.

APPENDIX G

ANALYTICAL REPORTS FOR INDICATOR, GROUND WATER QUALITY, AND HAZARDOUS CONSTITUENT PARAMETERS

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/A/18/1
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300423-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	706
pH	150.1	units	-	7.6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/A/18/2
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300423-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	708
pH	150.1	units	-	7.7

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-3

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/A/18/3
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300423-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	706
pH	150.1	units	-	7.7

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-4

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/A/18/4
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300423-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	707
pH	150.1	units	-	7.7

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300423

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300423-01	201A	MW1/B/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300423-02	201A	MW1/B/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300423-03	201A	MW1/B/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300423-04	201A	MW1/B/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

FGL Environmental

H. Neal Ht

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Steve Castellano

for Darrell H. Nelson, B.S.
Laboratory Director

Corporate Offices & Laboratory
P.O. Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
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Field Office
Visalia, California
TEL: (209) 734-9473
Mobile: (209) 738 6273

EGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

RE: Organic Analyses   Lab # SP 300423

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930203 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/03/93		ND
2	SP 300423-01	201A	MW1/C/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
3	SP 300423-02	201A	MW1/C/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
4	SP 300423-03	201A	MW1/C/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
5	SP 300423-04	201A	MW1/C/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	8.0

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2   Containers: (a) Amber Glass TFE-Cap   ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

~~EGL Env~~ironmental

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H. Nelson

Darrell H. Nelson, B.S.
Laboratory Director

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Visalia, California
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Mobile: (209) 738-6273

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW1/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 608-202A

EPA METHOD 608

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Endrin	0.2	ND	0.2	ND
Lindane	0.2	ND	0.2	ND
Methoxychlor	5	ND	5	ND
Toxaphene	5	ND	5	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
Hexachlorobenzene	67- 94	69	26-116	85
Dibutylchlorendate	89-146	102	44-125	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal H.

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW1/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 5, 1993
QA/QC ID# : 930201 615-205A

EPA METHOD 615

CONSTITUENT	SAMPLE DLR mg/L	SAMPLE RESULTS mg/L	LAB DLR mg/L	BLANK RESULTS mg/L
2,4-D	0.1	ND	0.1	ND
2,4,5-TP (Silvex)	0.01	ND	0.01	ND
SURROGATE	SAMPLE AR	SAMPLE % REC.	AR	% REC.
2,4-DCAA	30-150	130%	30-150	130%

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
mg/L = Milligrams Per Liter (ppm) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal HT

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/E/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201A

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS	MCL
Gross Alpha	900.0	pCi/L		0 ± 1	5-35
Gross Beta	900.0	pCi/L		4 ± 2	50
Total Radium	900.1	pCi/L		0.7 ± 1	5

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO_3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993 LAB No: 300423

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampled by : Abdun-nur/Bricker
Date Started : January 27, 1993
Date Finished : January 29, 1993

Date Sampled : January 27, 1993
Date Received : January 27, 1993

TEST RESULTS RE: BACTERIOLOGICAL ANALYSIS

Sample ID	Sample Type	Time Sampled	Time Start	Coliform MPN/100 ml	Fecal MPN/100 ml
MW1/F/18	Source	8:56A	03:13P	< 1.1 ABSENT	

The State Board of Public Health requires that bacteriological results must be "ABSENT" to meet drinking water requirements. Analyses were performed using Standard Methods 17th edition, APHA.

FGL ENVIRONMENTAL

Raquel R. Harvey

rrh

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Field Office
Visalia, California
TEL: (209) 734-9473

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 9, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW1/G,P/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 625-201A

EPA METHOD 625

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acenaphthene	10	ND	10	ND
Acenaphthylene	10	ND	10	ND
Aniline	50	ND	50	ND
Anthracene	10	ND	10	ND
Azobenzene	50	ND	50	ND
Benzidine	50	ND	50	ND
Benzo(a)anthracene	10	ND	10	ND
Benzo(a)pyrene	10	ND	10	ND
Benzo(b)fluoranthene	10	ND	10	ND
Benzo(k)fluoranthene	10	ND	10	ND
Benzo(g,h,i)perylene	10	ND	10	ND
Benzylalcohol	20	ND	20	ND
bis(2-Chloroethoxy)methane	10	ND	10	ND
bis(2-Chloroethyl)ether	10	ND	10	ND
bis(2-Chloroisopropyl)ether	10	ND	10	ND
bis(2-Ethylhexyl)phthalate	10	ND	10	ND
4-Bromophenylphenylether	10	ND	10	ND
Butylbenzylphthalate	10	ND	10	ND
Chloroaniline	10	ND	10	ND
Chloronaphthalene	10	ND	10	ND
Chlorophenylphenylether	10	ND	10	ND
Chrysene	10	ND	10	ND
Dibenzo(a,h)anthracene	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300423-1
Description: MW1/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Dibenzofuran	10	ND	10	ND
1,2-Dichlorobenzene	10	ND	10	ND
1,3-Dichlorobenzene	10	ND	10	ND
1,4-Dichlorobenzene	10	ND	10	ND
3,3'-Dichlorobenzidine	20	ND	20	ND
Diethylphthalate	10	ND	10	ND
Dimethylphthalate	10	ND	10	ND
Di-n-butylphthalate	10	ND	10	ND
2,4-Dinitrotoluene	10	ND	10	ND
2,6-Dinitrotoluene	10	ND	10	ND
Di-n-octylphthalate	10	ND	10	ND
Fluoranthene	10	ND	10	ND
Fluorene	10	ND	10	ND
Hexachlorobenzene	10	ND	10	ND
Hexachlorobutadiene	10	ND	10	ND
Hexachlorocyclopentadiene	10	ND	10	ND
Hexachloroethane	10	ND	10	ND
Indeno(1,2,3-c,d)pyrene	10	ND	10	ND
Isophorone	10	ND	10	ND
2-Methylnaphthalene	10	ND	10	ND
Naphthalene	10	ND	10	ND
Nitrobenzene	10	ND	10	ND
N-Nitrosodimethylamine	10	ND	10	ND
N-Nitrosodi-N-propylamine	10	ND	10	ND
N-Nitrosodiphenylamine	10	ND	10	ND
2-Nitroanaline	50	ND	50	ND
3-Nitroanaline	50	ND	50	ND
4-Nitroanaline	50	ND	50	ND
Phenanthrene	10	ND	10	ND
Pyrene	10	ND	10	ND
1,2,4-Trichlorobenzene	10	ND	10	ND
Benzoic Acid	50	ND	50	ND
2-Chlorophenol	10	ND	10	ND
2,4-Dichlorophenol	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300423-1
Description: MW1/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
2,4-Dimethylphenol	10	ND	10	ND
4,6-Dinitro-o-cresol	50	ND	50	ND
2,4-Dinitrophenol	50	ND	50	ND
2-Methylphenol	10	ND	10	ND
4-Methylphenol	10	ND	10	ND
2-Nitrophenol	10	ND	10	ND
4-Nitrophenol	50	ND	50	ND
p-Chloro-m-cresol	20	ND	20	ND
Pentachlorophenol	50	ND	50	ND
Phenol	10	ND	10	ND
2,4,5-Trichlorophenol	10	ND	10	ND
2,4,6-Trichlorophenol	10	ND	10	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
2-Fluorobiphenyl	34- 99	65	34-99	61
Nitrobenzene-d5	37- 94	74	37-94	74
p-Terphenyl-d14	57- 94	64	57-94	72
2-Fluorophenol	12- 82	64	12-82	71
Phenol-d6	23- 62	63*	23-62	68*
2,4,6-Tribromophenol	49-102	69	49-102	75

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

Note: *Surrogate recovery is above acceptance range; however, all other QC criteria were met.

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H. Nelson, B.S.
Laboratory Director

mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/H/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Chloride	300.0	mg/L	1	137
Sulfate	300.0	mg/L	1	6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/I/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Phosphorous, Ortho	365.2	mg/L	0.1	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 11, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/K,M/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201M

Analytical Results - Dissolved

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Antimony	7041	ug/L	100	ND
Arsenic	7060	ug/L	50	ND
Barium	6010	ug/L	100	ND
Cadmium	7131	ug/L	10	ND
Chromium	7191	ug/L	50	ND
Copper	6010	ug/L	100	ND
Lead	7421	ug/L	50	ND
Mercury	7470	ug/L	1	ND
Selenium	7740	ug/L	10	ND
Silver	7761	ug/L	10	ND
Thallium	7841	ug/L	1000	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO_3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW1/N/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Fluoride	340.2	mg/L	0.1	0.2

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

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ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300423-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW1/0/18
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300423-1
Description: MW1/0/18

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	93	61-164	86
Toluene-d8	81-117	99	81-117	96
BFB	62-124	97	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Results of Analysis
for
FGL Environmental

Client Reference: SP300437
Clayton Project No. 93012.62

Sample Matrix/Media: WATER
Preparation Method: EPA 8315 (Draft)
Analysis Method: EPA 8315 (Draft)

Date Received: 01/29/93
Date Prepared: 02/02/93
Date Analyzed: 02/03/93

Lab Number	Sample Identification		Date Sampled	Formaldehyde (ug/L)	Detection Limit (ug/L)
01A	1	MW1	01/27/93	<20	20
02A	2	MW2	01/27/93	<20	20
03A	3	MW3	01/27/93	<20	20
04A	4	MW5	01/27/93	<20	20
05A	5	MW6	01/27/93	<20	20
06A	6	MW7	01/27/93	<20	20
07A	7	MW8	01/27/93	<20	20
08A	8	MW9	01/27/93	<20	20
09A	9	MW10	01/27/93	<20	20
10A	METHOD BLANK		--	15[a]	20

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

[a] Actual blank value; sample results have been blank corrected.

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/A/18/1
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300440-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	637
pH	150.1	units	-	7.6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/A/18/2
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300440-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	640
pH	150.1	units	-	7.6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-3

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/A/18/3
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300440-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	643
pH	150.1	units	-	7.6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-4

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/A/18/4
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300440-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	639
pH	150.1	units	-	7.6

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300440

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300440-01	201A	MW3/B/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300440-02	201A	MW3/B/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300440-03	201A	MW3/B/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300440-04	201A	MW3/B/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

FGL Environmental

H. Neal Hutchison

Steve Castellano

H. Neal Hutchison, B.S.
Organic Laboratory Manager

for Darrell H. Nelson, B.S.
Laboratory Director

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300440

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930202 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300440-01	201A	MW3/C/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300440-02	201A	MW3/C/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300440-03	201A	MW3/C/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300440-04	201A	MW3/C/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental

Steve Castellano

for Darrell H. Nelson, B.S.
Laboratory Director

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW3/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 608-202A

EPA METHOD 608

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Endrin	0.2	ND	0.2	ND
Lindane	0.2	ND	0.2	ND
Methoxychlor	5	ND	5	ND
Toxaphene	5	ND	5	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
Hexachlorobenzene	67- 94	74	26-116	85
Dibutylchlorendate	89-146	88	44-125	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW3/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 2, 1993
Analyzed : February 5, 1993
QA/QC ID# : 930202 615-205A

EPA METHOD 615

CONSTITUENT	SAMPLE DLR mg/L	SAMPLE RESULTS mg/L	LAB DLR mg/L	BLANK RESULTS mg/L
2,4-D	0.1	ND	0.1	ND
2,4,5-TP (Silvex)	0.01	ND	0.01	ND
SURROGATE	SAMPLE AR	SAMPLE % REC.	AR	% REC.
2,4-DCAA	30-150	140%	30-150	116%

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
mg/L = Milligrams Per Liter (ppm) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H. Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/E/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300440-201A

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS	MCL
Gross Alpha	900.0	pCi/L		0.8 ± 1	5-35
Gross Beta	900.0	pCi/L		2 ± 2	50
Total Radium	900.1	pCi/L		0.6 ± 1	5

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampled by : Abdun-nur/Bricker
Date Started : January 27, 1993
Date Finished : January 29, 1993

Date Sampled : January 27, 1993
Date Received : January 27, 1993

TEST RESULTS RE: **BACTERIOLOGICAL ANALYSIS**

Sample ID	Sample Type	Time Sampled	Time Start	Coliform MPN/100 ml	Fecal MPN/100 ml
MW3/F/18	Source	8:29A	03:15P	< 1.1	ABSENT

The State Board of Public Health requires that bacteriological results must be "ABSENT" to meet drinking water requirements. Analyses were performed using Standard Methods 17th edition, APHA.

FGL ENVIRONMENTAL

Raquel R. Harvey

rrh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW3/G,P/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 3, 1993
QA/QC ID# : 930201 625-201A

EPA METHOD 625

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acenaphthene	10	ND	10	ND
Acenaphthylene	10	ND	10	ND
Aniline	50	ND	50	ND
Anthracene	10	ND	10	ND
Azobenzene	50	ND	50	ND
Benzidine	50	ND	50	ND
Benzo(a)anthracene	10	ND	10	ND
Benzo(a)pyrene	10	ND	10	ND
Benzo(b)fluoranthene	10	ND	10	ND
Benzo(k)fluoranthene	10	ND	10	ND
Benzo(g,h,i)perylene	10	ND	10	ND
Benzylalcohol	20	ND	20	ND
bis(2-Chloroethoxy)methane	10	ND	10	ND
bis(2-Chloroethyl)ether	10	ND	10	ND
bis(2-Chloroisopropyl)ether	10	ND	10	ND
bis(2-Ethylhexyl)phthalate	10	ND	10	ND
4-Bromophenylphenylether	10	ND	10	ND
Butylbenzylphthalate	10	ND	10	ND
Chloroaniline	10	ND	10	ND
Chloronaphthalene	10	ND	10	ND
Chlorophenylphenylether	10	ND	10	ND
Chrysene	10	ND	10	ND
Dibenzo(a,h)anthracene	10	ND	10	ND

Table cont'd next page ...

Corporate Offices & Laboratory
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Santa Paula, CA 93061-0272

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215

Field Office
Visalia, California
TEL: (209) 734-9473

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300440-1
Description: MW3/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Dibenzofuran	10	ND	10	ND
1,2-Dichlorobenzene	10	ND	10	ND
1,3-Dichlorobenzene	10	ND	10	ND
1,4-Dichlorobenzene	10	ND	10	ND
3,3'-Dichlorobenzidine	20	ND	20	ND
Diethylphthalate	10	ND	10	ND
Dimethylphthalate	10	ND	10	ND
Di-n-butylphthalate	10	ND	10	ND
2,4-Dinitrotoluene	10	ND	10	ND
2,6-Dinitrotoluene	10	ND	10	ND
Di-n-octylphthalate	10	ND	10	ND
Fluoranthene	10	ND	10	ND
Fluorene	10	ND	10	ND
Hexachlorobenzene	10	ND	10	ND
Hexachlorobutadiene	10	ND	10	ND
Hexachlorocyclopentadiene	10	ND	10	ND
Hexachloroethane	10	ND	10	ND
Indeno(1,2,3-c,d)pyrene	10	ND	10	ND
Isophorone	10	ND	10	ND
2-Methylnaphthalene	10	ND	10	ND
Naphthalene	10	ND	10	ND
Nitrobenzene	10	ND	10	ND
N-Nitrosodimethylamine	10	ND	10	ND
N-Nitrosodi-N-propylamine	10	ND	10	ND
N-Nitrosodiphenylamine	10	ND	10	ND
2-Nitroanaline	50	ND	50	ND
3-Nitroanaline	50	ND	50	ND
4-Nitroanaline	50	ND	50	ND
Phenanthrene	10	ND	10	ND
Pyrene	10	ND	10	ND
1,2,4-Trichlorobenzene	10	ND	10	ND
Benzoic Acid	50	ND	50	ND
2-Chlorophenol	10	ND	10	ND
2,4-Dichlorophenol	10	ND	10	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300440-1
Description: MW3/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
2,4-Dimethylphenol	10	ND	10	ND
4,6-Dinitro-o-cresol	50	ND	50	ND
2,4-Dinitrophenol	50	ND	50	ND
2-Methylphenol	10	ND	10	ND
4-Methylphenol	10	ND	10	ND
2-Nitrophenol	10	ND	10	ND
4-Nitrophenol	50	ND	50	ND
p-Chloro-m-cresol	20	ND	20	ND
Pentachlorophenol	50	ND	50	ND
Phenol	10	ND	10	ND
2,4,5-Trichlorophenol	10	ND	10	ND
2,4,6-Trichlorophenol	10	ND	10	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
2-Fluorobiphenyl	34- 99	71	34-99	61
Nitrobenzene-d5	37- 94	56	37-94	74
p-Terphenyl-d14	57- 94	55	57-94	72
2-Fluorophenol	12- 82	60	12-82	71
Phenol-d6	23- 62	64	23-62	68*
2,4,6-Tribromophenol	49-102	68	49-102	75

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal H.

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/H/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Chloride	300.0	mg/L	1	30
Sulfate	300.0	mg/L	1	69

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/I/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Phosphorous, Ortho	365.2	mg/L	0.1	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 11, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/K,M/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201M

Analytical Results - Dissolved

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Antimony	7041	ug/L	100	ND
Arsenic	7060	ug/L	50	ND
Barium	6010	ug/L	100	ND
Cadmium	7131	ug/L	10	ND
Chromium	7191	ug/L	50	ND
Copper	6010	ug/L	100	ND
Lead	7421	ug/L	50	ND
Mercury	7470	ug/L	1	ND
Selenium	7740	ug/L	10	ND
Silver	7761	ug/L	10	ND
Thallium	7841	ug/L	1000	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO_3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW3/N/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Fluoride	340.2	mg/L	0.1	0.3

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

EGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300440-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW3/0/18
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

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2500 Stagecoach Road
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TEL: (209) 734-9473

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300440-1
Description: MW3/0/18

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	85	61-164	86
Toluene-d8	81-117	98	81-117	96
BFB	62-124	103	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Clayton
ENVIRONMENTAL CONSULTANTS

Results of Analysis
for
FGL Environmental

Client Reference: SP300437
Clayton Project No. 93012.62

Sample Matrix/Media:	WATER		Date Received:	01/29/93
Preparation Method:	EPA 8315(Draft)		Date Prepared:	02/02/93
Analysis Method:	EPA 8315(Draft)		Date Analyzed:	02/03/93

Lab Number	Sample Identification		Date Sampled	Formaldehyde (ug/L)	Detection Limit (ug/L)
01A	1	MW1	01/27/93	<20	20
02A	2	MW2	01/27/93	<20	20
03A	3	MW3	01/27/93	<20	20
04A	4	MW5	01/27/93	<20	20
05A	5	MW6	01/27/93	<20	20
06A	6	MW7	01/27/93	<20	20
07A	7	MW8	01/27/93	<20	20
08A	8	MW9	01/27/93	<20	20
09A	9	MW10	01/27/93	<20	20
10A	METHOD BLANK		--	15[a]	20

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

[1] Actual blank value; sample results have been blank corrected.

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/A/18/1
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300441-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	532
pH	150.1	units	-	7.9

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/A/18/2
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300441-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	534
pH	150.1	units	-	7.8

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-3

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/A/18/3
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300441-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	536
pH	150.1	units	-	7.8

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-4

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/A/18/4
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300441-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	537
pH	150.1	units	-	7.9

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

RE: Organic Analyses   Lab # SP 300441

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300441-01	201A	MW5/B/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300441-02	201A	MW5/B/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300441-03	201A	MW5/B/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300441-04	201A	MW5/B/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2   Containers: (a) Amber Glass TFE-Cap   ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental
Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300441

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930202 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300441-01	201A	MW5/C/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300441-02	201A	MW5/C/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	5
4	SP 300441-03	201A	MW5/C/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300441-04	201A	MW5/C/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

FGL Environmental

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Steve Castellano

for Darrell H. Nelson, B.S.
Laboratory Director

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW5/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 608-202A

EPA METHOD 608

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Endrin	0.2	ND	0.2	ND
Lindane	0.2	ND	0.2	ND
Methoxychlor	5	ND	5	ND
Toxaphene	5	ND	5	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
Hexachlorobenzene	67- 94	88	26-116	85
Dibutylchlorendate	89-146	96	44-125	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

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FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW5/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 2, 1993
Analyzed : February 5, 1993
QA/QC ID# : 930202 615-205A

EPA METHOD 615

CONSTITUENT	SAMPLE DLR mg/L	SAMPLE RESULTS mg/L	LAB DLR mg/L	BLANK RESULTS mg/L
2,4-D	0.1	ND	0.1	ND
2,4,5-TP (Silvex)	0.01	ND	0.01	ND

SURROGATE	SAMPLE AR	SAMPLE % REC.	AR	% REC.
2,4-DCAA	30-150	140%	30-150	116%

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
mg/L = Milligrams Per Liter (ppm) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/E/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300441-201A

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS	MCL
Gross Alpha	900.0	pCi/L		0.4 ± 1	5-35
Gross Beta	900.0	pCi/L		0.7 ± 2	50
Total Radium	900.1	pCi/L		0.5 ± 1	5

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993 LAB No: 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampled by : Abdun-nur/Bricker
Date Started : January 27, 1993
Date Finished : January 29, 1993

Date Sampled : January 27, 1993
Date Received : January 27, 1993

TEST RESULTS RE: **BACTERIOLOGICAL ANALYSIS**

Sample ID	Sample Type	Time Sampled	Time Start	Coliform MPN/100 ml	Fecal MPN/100 ml
MW5/F/18	Source	9:51A	03:16P	< 1.1 ABSENT	

The State Board of Public Health requires that bacteriological results must be "ABSENT" to meet drinking water requirements. Analyses were performed using Standard Methods 17th edition, APHA.

FGL ENVIRONMENTAL

Raquel R. Harvey

rrh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 9, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW5/G,P/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 625-201A

EPA METHOD 625

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acenaphthene	10	ND	10	ND
Acenaphthylene	10	ND	10	ND
Aniline	50	ND	50	ND
Anthracene	10	ND	10	ND
Azobenzene	50	ND	50	ND
Benzidine	50	ND	50	ND
Benzo(a)anthracene	10	ND	10	ND
Benzo(a)pyrene	10	ND	10	ND
Benzo(b)fluoranthene	10	ND	10	ND
Benzo(k)fluoranthene	10	ND	10	ND
Benzo(g,h,i)perylene	10	ND	10	ND
Benzylalcohol	20	ND	20	ND
bis(2-Chloroethoxy)methane	10	ND	10	ND
bis(2-Chloroethyl)ether	10	ND	10	ND
bis(2-Chloroisopropyl)ether	10	ND	10	ND
bis(2-Ethylhexyl)phthalate	10	ND	10	ND
4-Bromophenylphenylether	10	ND	10	ND
Butylbenzylphthalate	10	ND	10	ND
Chloroaniline	10	ND	10	ND
Chloronaphthalene	10	ND	10	ND
Chlorophenylphenylether	10	ND	10	ND
Chrysene	10	ND	10	ND
Dibenzo(a,h)anthracene	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300441-1
Description: MW5/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Dibenzofuran	10	ND	10	ND
1,2-Dichlorobenzene	10	ND	10	ND
1,3-Dichlorobenzene	10	ND	10	ND
1,4-Dichlorobenzene	10	ND	10	ND
3,3'-Dichlorobenzidine	20	ND	20	ND
Diethylphthalate	10	ND	10	ND
Dimethylphthalate	10	ND	10	ND
Di-n-butylphthalate	10	ND	10	ND
2,4-Dinitrotoluene	10	ND	10	ND
2,6-Dinitrotoluene	10	ND	10	ND
Di-n-octylphthalate	10	ND	10	ND
Fluoranthene	10	ND	10	ND
Fluorene	10	ND	10	ND
Hexachlorobenzene	10	ND	10	ND
Hexachlorobutadiene	10	ND	10	ND
Hexachlorocyclopentadiene	10	ND	10	ND
Hexachloroethane	10	ND	10	ND
Indeno(1,2,3-c,d)pyrene	10	ND	10	ND
Isophorone	10	ND	10	ND
2-Methylnaphthalene	10	ND	10	ND
Naphthalene	10	ND	10	ND
Nitrobenzene	10	ND	10	ND
N-Nitrosodimethylamine	10	ND	10	ND
N-Nitrosodi-N-propylamine	10	ND	10	ND
N-Nitrosodiphenylamine	10	ND	10	ND
2-Nitroanaline	50	ND	50	ND
3-Nitroanaline	50	ND	50	ND
4-Nitroanaline	50	ND	50	ND
Phenanthrene	10	ND	10	ND
Pyrene	10	ND	10	ND
1,2,4-Trichlorobenzene	10	ND	10	ND
Benzoic Acid	50	ND	50	ND
2-Chlorophenol	10	ND	10	ND
2,4-Dichlorophenol	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300441-1
Description: MW5/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
2,4-Dimethylphenol	10	ND	10	ND
4,6-Dinitro-o-cresol	50	ND	50	ND
2,4-Dinitrophenol	50	ND	50	ND
2-Methylphenol	10	ND	10	ND
4-Methylphenol	10	ND	10	ND
2-Nitrophenol	10	ND	10	ND
4-Nitrophenol	50	ND	50	ND
p-Chloro-m-cresol	20	ND	20	ND
Pentachlorophenol	50	ND	50	ND
Phenol	10	ND	10	ND
2,4,5-Trichlorophenol	10	ND	10	ND
2,4,6-Trichlorophenol	10	ND	10	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
2-Fluorobiphenyl	34- 99	75	34-99	61
Nitrobenzene-d5	37- 94	70	37-94	74
p-Terphenyl-d14	57- 94	93	57-94	72
2-Fluorophenol	12- 82	25	12-82	71
Phenol-d6	23- 62	53	23-62	68*
2,4,6-Tribromophenol	49-102	68	49-102	75

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

*Surrogate recovery is above acceptance range; however, all other QC criteria were met.

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/H/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Chloride	300.0	mg/L	1	36
Nitrate	300.0	mg/L	0.5	2.2
Sodium	200.7	mg/L	1	50
Sulfate	300.0	mg/L	1	33
Iron	6010	mg/L	0.05	ND
Manganese	6010	mg/L	0.03	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

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Stockton, CA 95215

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Visalia, California
TEL: (209) 734-9473

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/I/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Phosphorous, Ortho	365.2	mg/L	0.1	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 11, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/K,M/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201M

Analytical Results - Dissolved

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Antimony	7041	ug/L	100	ND
Arsenic	7060	ug/L	50	ND
Barium	6010	ug/L	100	270
Cadmium	7131	ug/L	10	ND
Chromium	7191	ug/L	50	ND
Copper	6010	ug/L	100	ND
Lead	7421	ug/L	50	ND
Mercury	7470	ug/L	1	ND
Selenium	7740	ug/L	10	ND
Silver	7761	ug/L	10	ND
Thallium	7841	ug/L	1000	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW5/N/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Fluoride	340.2	mg/L	0.1	0.2

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300441-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW5/0/18
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300441-1
Description: MW5/0/18

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	85	61-164	86
Toluene-d8	81-117	101	81-117	96
BFB	62-124	105	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal H

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Clayton
ENVIRONMENTAL CONSULTANTS

Results of Analysis
for
FGL Environmental

Client Reference: SP300437
Clayton Project No. 93012.62

Sample Matrix/Media: WATER
Preparation Method: EPA 8315 (Draft)
Analysis Method: EPA 8315 (Draft)

Date Received: 01/29/93
Date Prepared: 02/02/93
Date Analyzed: 02/03/93

Lab Number	Sample Identification		Date Sampled	Formaldehyde (ug/L)	Detection Limit (ug/L)
01A	1	MW1	01/27/93	<20	20
02A	2	MW2	01/27/93	<20	20
03A	3	MW3	01/27/93	<20	20
04A	4	MW5	01/27/93	<20	20
05A	5	MW6	01/27/93	<20	20
06A	6	MW7	01/27/93	<20	20
07A	7	MW8	01/27/93	<20	20
08A	8	MW9	01/27/93	<20	20
09A	9	MW10	01/27/93	<20	20
10A	METHOD BLANK		--	15 [a]	20

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

[a] Actual blank value; sample results have been blank corrected.

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/A/18/1
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300442-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	542
pH	150.1	units	-	7.8

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/A/18/2
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300442-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	545
pH	150.1	units	-	7.8

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-3

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/A/18/3
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300442-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	544
pH	150.1	units	-	7.9

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-4

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/A/18/4
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300442-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	546
pH	150.1	units	-	7.8

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300442

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300442-01	201A	MW6/B/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300442-02	201A	MW6/B/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300442-03	201A	MW6/B/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300442-04	201A	MW6/B/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental

Steve Castellano

for Darrell H. Nelson, B.S.
Laboratory Director

Corporate Offices & Laboratory
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ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

RE: Organic Analyses Lab # SP 300442

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930203 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/03/93		ND
2	SP 300442-01	201A	MW6/C/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
3	SP 300442-02	201A	MW6/C/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
4	SP 300442-03	201A	MW6/C/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	6.0
5	SP 300442-04	201A	MW6/C/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

H Neal Ht

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental
Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

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ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW6/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 28, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 608-202A

EPA METHOD 608

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Endrin	0.2	ND	0.2	ND
Lindane	0.2	ND	0.2	ND
Methoxychlor	5	ND	5	ND
Toxaphene	5	ND	5	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
Hexachlorobenzene	67- 94	88	26-116	85
Dibutylchlorendate	89-146	97	44-125	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H. Nelson, B.S.
Laboratory Director

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FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW6/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 28, 1993
Extracted : February 2, 1993
Analyzed : February 5, 1993
QA/QC ID# : 930202 615-205A

EPA METHOD 615

CONSTITUENT	SAMPLE DLR mg/L	SAMPLE RESULTS mg/L	LAB DLR mg/L	BLANK RESULTS mg/L
2,4-D	0.1	ND	0.1	ND
2,4,5-TP (Silvex)	0.01	ND	0.01	ND
SURROGATE	**SAMPLE AR**	**SAMPLE % REC.**	**AR**	**% REC.**
2,4-DCAA	30-150	760%	30-150	116%

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
mg/L = Milligrams Per Liter (ppm) ND = Not Detected at or above the DLR. AR = Acceptable Range

Note: * Surrogate recovery is out of spec due to matrix interference.

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal HT

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/E/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300442-201A

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS	MCL
Gross Alpha	900.0	pCi/L		0.6 ± 1	5-35
Gross Beta	900.0	pCi/L		3 ± 2	50
Total Radium	900.1	pCi/L		0.4 ± 1	5

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO_3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993 LAB No: 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampled by : Abdun-nur/Bricker
Date Started : January 27, 1993
Date Finished : January 29, 1993

Date Sampled : January 27, 1993
Date Received : January 28, 1993

TEST RESULTS RE: **BACTERIOLOGICAL ANALYSIS**

Sample ID	Sample Type	Time Sampled	Time Start	Coliform MPN/100 ml	Fecal MPN/100 ml
MW6/F/18	Source	10:24A	03:17P	< 1.1	ABSENT

The State Board of Public Health requires that bacteriological results must be "ABSENT" to meet drinking water requirements. Analyses were performed using Standard Methods 17th edition, APHA.

FGL ENVIRONMENTAL

Raquel R. Harvey

rrh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 9, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW6/G,P/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 3, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930203 625-201A

EPA METHOD 625

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acenaphthene	10	ND	10	ND
Acenaphthylene	10	ND	10	ND
Aniline	50	ND	50	ND
Anthracene	10	ND	10	ND
Azobenzene	50	ND	50	ND
Benzidine	50	ND	50	ND
Benzo(a)anthracene	10	ND	10	ND
Benzo(a)pyrene	10	ND	10	ND
Benzo(b)fluoranthene	10	ND	10	ND
Benzo(k)fluoranthene	10	ND	10	ND
Benzo(g,h,i)perylene	10	ND	10	ND
Benzylalcohol	20	ND	20	ND
bis(2-Chloroethoxy)methane	10	ND	10	ND
bis(2-Chloroethyl)ether	10	ND	10	ND
bis(2-Chloroisopropyl)ether	10	ND	10	ND
bis(2-Ethylhexyl)phthalate	10	ND	10	ND
4-Bromophenylphenylether	10	ND	10	ND
Butylbenzylphthalate	10	ND	10	ND
Chloroaniline	10	ND	10	ND
Chloronaphthalene	10	ND	10	ND
Chlorophenylphenylether	10	ND	10	ND
Chrysene	10	ND	10	ND
Dibenzo(a,h)anthracene	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300442-1
Description: MW6/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Dibenzofuran	10	ND	10	ND
1,2-Dichlorobenzene	10	ND	10	ND
1,3-Dichlorobenzene	10	ND	10	ND
1,4-Dichlorobenzene	10	ND	10	ND
3,3'-Dichlorobenzidine	20	ND	20	ND
Diethylphthalate	10	ND	10	ND
Dimethylphthalate	10	ND	10	ND
Di-n-butylphthalate	10	ND	10	ND
2,4-Dinitrotoluene	10	ND	10	ND
2,6-Dinitrotoluene	10	ND	10	ND
Di-n-octylphthalate	10	ND	10	ND
Fluoranthene	10	ND	10	ND
Fluorene	10	ND	10	ND
Hexachlorobenzene	10	ND	10	ND
Hexachlorobutadiene	10	ND	10	ND
Hexachlorocyclopentadiene	10	ND	10	ND
Hexachloroethane	10	ND	10	ND
Indeno(1,2,3-c,d)pyrene	10	ND	10	ND
Isophorone	10	ND	10	ND
2-Methylnaphthalene	10	ND	10	ND
Naphthalene	10	ND	10	ND
Nitrobenzene	10	ND	10	ND
N-Nitrosodimethylamine	10	ND	10	ND
N-Nitrosodi-N-propylamine	10	ND	10	ND
N-Nitrosodiphenylamine	10	ND	10	ND
2-Nitroanaline	50	ND	50	ND
3-Nitroanaline	50	ND	50	ND
4-Nitroanaline	50	ND	50	ND
Phenanthrene	10	ND	10	ND
Pyrene	10	ND	10	ND
1,2,4-Trichlorobenzene	10	ND	10	ND
Benzoic Acid	50	ND	50	ND
2-Chlorophenol	10	ND	10	ND
2,4-Dichlorophenol	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300442-1
Description: MW6/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
2,4-Dimethylphenol	10	ND	10	ND
4,6-Dinitro-o-cresol	50	ND	50	ND
2,4-Dinitrophenol	50	ND	50	ND
2-Methylphenol	10	ND	10	ND
4-Methylphenol	10	ND	10	ND
2-Nitrophenol	10	ND	10	ND
4-Nitrophenol	50	ND	50	ND
p-Chloro-m-cresol	20	ND	20	ND
Pentachlorophenol	50	ND	50	ND
Phenol	10	ND	10	ND
2,4,5-Trichlorophenol	10	ND	10	ND
2,4,6-Trichlorophenol	10	ND	10	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
2-Fluorobiphenyl	34- 99	71	34-99	70
Nitrobenzene-d5	37- 94	70	37-94	64
p-Terphenyl-d14	57- 94	96*	57-94	93
2-Fluorophenol	12- 82	25	12-82	25
Phenol-d6	23- 62	53	23-62	49
2,4,6-Tribromophenol	49-102	65	49-102	68

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

Note: *Surrogate recovery is above acceptance range; however, all other QC criteria were met.

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hut

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/I/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Phosphorous, Ortho	365.2	mg/L	0.1	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/H/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Chloride	300.0	mg/L	1	57
Nitrate	300.0	mg/L	0.5	2.4
Sodium	200.7	mg/L	1	45
Sulfate	300.0	mg/L	1	23
Iron	6010	mg/L	0.05	ND
Manganese	6010	mg/L	0.03	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 11, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/K,M/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201M

Analytical Results - Dissolved

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Antimony	7041	ug/L	100	ND
Arsenic	7060	ug/L	50	ND
Barium	6010	ug/L	100	ND
Cadmium	7131	ug/L	10	ND
Chromium	7191	ug/L	50	ND
Copper	6010	ug/L	100	ND
Lead	7421	ug/L	50	ND
Mercury	7470	ug/L	1	ND
Selenium	7740	ug/L	10	ND
Silver	7761	ug/L	10	ND
Thallium	7841	ug/L	1000	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW6/N/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Fluoride	340.2	mg/L	0.1	0.2

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
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Darrell H. Nelson, B.S.
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FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993 LAB No: SP 300442-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW6/0/18
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

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TEL (209) 734-9473

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300442-1
Description: MW6/0/18

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	85	61-164	86
Toluene-d8	81-117	99	81-117	96
BFB	62-124	103	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Results of Analysis
for
FGL Environmental

Client Reference: SP300437
Clayton Project No. 93012.62

Sample Matrix/Media: WATER
Preparation Method: EPA 8315 (Draft)
Analysis Method: EPA 8315 (Draft)

Date Received: 01/29/93
Date Prepared: 02/02/93
Date Analyzed: 02/03/93

Lab Number	Sample Identification		Date Sampled	Formaldehyde (ug/L)	Detection Limit (ug/L)
01A	1	MW1	01/27/93	<20	20
02A	2	MW2	01/27/93	<20	20
03A	3	MW3	01/27/93	<20	20
04A	4	MW5	01/27/93	<20	20
05A	5	MW6	01/27/93	<20	20
06A	6	MW7	01/27/93	<20	20
07A	7	MW8	01/27/93	<20	20
08A	8	MW9	01/27/93	<20	20
09A	9	MW10	01/27/93	<20	20
10A	METHOD BLANK		--	15[a]	20

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

[a] Actual blank value; sample results have been blank corrected.

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/A/18/1
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	631
pH	150.1	units	-	8.0

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-2

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/A/18/2
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : January 28, 1993
QA/QC ID# : 930128 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	635
pH	150.1	units	-	8.0

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

February 10, 1993

LAB No: SP 300449-3

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/A/18/3
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : January 28, 1993
QA/QC ID# : 930128 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	635
pH	150.1	units	-	8.0

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-4

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/A/18/4
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : January 28, 1993
QA/QC ID# : 930128 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Conductivity	120.1	umhos/cm2	1	635
pH	150.1	units	-	8.0

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson
Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson
Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 3, 1993

RE: Organic Analyses Lab # SP 300449

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOC
1	19930202 TOC	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/02/93		ND
2	SP 300449-01	201A	MW10/B/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
3	SP 300449-02	201A	MW10/B/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
4	SP 300449-03	201A	MW10/B/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND
5	SP 300449-04	201A	MW10/B/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/02/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 0.5 mg/L by EPA Method 415.1

If you have any questions Please call.

H. Neal Hutchison
H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental
Steve Castellano
for Darrell H. Nelson, B.S.
Laboratory Director

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FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

RE: Organic Analyses Lab # SP 300449

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampling Site: Bermite 85-01.4

ANALYTICAL RESULTS

ID	Sample Number	Batch ID	Sample Description	Sample Type	Grab or Comp.	Sampled by	Date Sampled	Date Received	Date Extracted	Date Analyzed	Samp. Container & Preservatives	TOX
1	19930203 TOX	201A	QA/QC Blank	Lab. Blank Water	---		----	----	N/A	02/03/93		ND
2	SP 300449-01	201A	MW10/C/18/1	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
3	SP 300449-02	201A	MW10/C/18/2	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
4	SP 300449-03	201A	MW10/C/18/3	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND
5	SP 300449-04	201A	MW10/C/18/4	Monitoring Well	Grab	Abdun-nur/Bricker	01/27/93	01/27/93	N/A	02/03/93	1,2,a	ND

Preservatives: (1) Cool 4°C (2) H_2SO_4 pH < 2 Containers: (a) Amber Glass TFE-Cap ND = Not Detected at a DLR of 5 ug/L by EPA Method 9020

If you have any questions Please call.

H. Neal Hutchison

H. Neal Hutchison, B.S.
Organic Laboratory Manager

FGL Environmental
Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

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ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW10/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 1, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930201 608-202A

EPA METHOD 608

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Endrin	0.2	ND	0.2	ND
Lindane	0.2	ND	0.2	ND
Methoxychlor	5	ND	5	ND
Toxaphene	5	ND	5	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
Hexachlorobenzene	67- 94	81	26-116	85
Dibutylchlorendate	89-146	104	44-125	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 15, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW10/D/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 2, 1993
Analyzed : February 5, 1993
QA/QC ID# : 930202 615-205A

EPA METHOD 615

CONSTITUENT	SAMPLE DLR mg/L	SAMPLE RESULTS mg/L	LAB DLR mg/L	BLANK RESULTS mg/L
2,4-D	0.1	ND	0.1	ND
2,4,5-TP (Silvex)	0.01	ND	0.01	ND
SURROGATE	**SAMPLE AR**	**SAMPLE % REC.**	**AR**	**% REC.**
2,4-DCAA	30-150	149%	30-150	116%

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
mg/L = Milligrams Per Liter (ppm) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal H

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Corporate Offices & Laboratory
P.O. Box 272 / 853 Corporation Street

Office & Laboratory

Field Office
Visalia, California

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/E/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300449-201A

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS	MCL
Gross Alpha	900.0	pCi/L		0.4 ± 1	5-35
Gross Beta	900.0	pCi/L		2 ± 2	50
Total Radium	900.1	pCi/L		0 ± 1	5

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993 LAB No: 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

Sampled by : Abdun-nur/Bricker
Date Started : January 27, 1993
Date Finished : January 31, 1993

Date Sampled : January 27, 1993
Date Received : January 27, 1993

TEST RESULTS RE: BACTERIOLOGICAL ANALYSIS

Sample ID	Sample Type	Time Sampled	Time Start	Coliform MPN/100 ml		Fecal MPN/100 ml	
MW10/F/18	Source	9:24A	03:21P	24.0	PRESENT	< 1.1	ABSENT

The State Board of Public Health requires that bacteriological results must be "ABSENT" to meet drinking water requirements. Analyses were performed using Standard Methods 17th edition, APHA.

FGL ENVIRONMENTAL

Raquel R. Harvey

rrh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 9, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW10/G,P/18
Sampled by : Abdun-nur/Bricker
Container : Amber Glass TFE-Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : February 3, 1993
Analyzed : February 4, 1993
QA/QC ID# : 930203 625-201A

EPA METHOD 625

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acenaphthene	10	ND	10	ND
Acenaphthylene	10	ND	10	ND
Aniline	50	ND	50	ND
Anthracene	10	ND	10	ND
Azobenzene	50	ND	50	ND
Benzidine	50	ND	50	ND
Benzo(a)anthracene	10	ND	10	ND
Benzo(a)pyrene	10	ND	10	ND
Benzo(b)fluoranthene	10	ND	10	ND
Benzo(k)fluoranthene	10	ND	10	ND
Benzo(g,h,i)perylene	10	ND	10	ND
Benzylalcohol	20	ND	20	ND
bis(2-Chloroethoxy)methane	10	ND	10	ND
bis(2-Chloroethyl)ether	10	ND	10	ND
bis(2-Chloroisopropyl)ether	10	ND	10	ND
bis(2-Ethylhexyl)phthalate	10	ND	10	ND
4-Bromophenylphenylether	10	ND	10	ND
Butylbenzylphthalate	10	ND	10	ND
Chloroaniline	10	ND	10	ND
Chloronaphthalene	10	ND	10	ND
Chlorophenylphenylether	10	ND	10	ND
Chrysene	10	ND	10	ND
Dibenzo(a,h)anthracene	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300449-1
Description: MW10/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Dibenzofuran	10	ND	10	ND
1,2-Dichlorobenzene	10	ND	10	ND
1,3-Dichlorobenzene	10	ND	10	ND
1,4-Dichlorobenzene	10	ND	10	ND
3,3'-Dichlorobenzidine	20	ND	20	ND
Diethylphthalate	10	ND	10	ND
Dimethylphthalate	10	ND	10	ND
Di-n-butylphthalate	10	ND	10	ND
2,4-Dinitrotoluene	10	ND	10	ND
2,6-Dinitrotoluene	10	ND	10	ND
Di-n-octylphthalate	10	ND	10	ND
Fluoranthene	10	ND	10	ND
Fluorene	10	ND	10	ND
Hexachlorobenzene	10	ND	10	ND
Hexachlorobutadiene	10	ND	10	ND
Hexachlorocyclopentadiene	10	ND	10	ND
Hexachloroethane	10	ND	10	ND
Indeno(1,2,3-c,d)pyrene	10	ND	10	ND
Isophorone	10	ND	10	ND
2-Methylnaphthalene	10	ND	10	ND
Naphthalene	10	ND	10	ND
Nitrobenzene	10	ND	10	ND
N-Nitrosodimethylamine	10	ND	10	ND
N-Nitrosodi-N-propylamine	10	ND	10	ND
N-Nitrosodiphenylamine	10	ND	10	ND
2-Nitroanaline	50	ND	50	ND
3-Nitroanaline	50	ND	50	ND
4-Nitroanaline	50	ND	50	ND
Phenanthrene	10	ND	10	ND
Pyrene	10	ND	10	ND
1,2,4-Trichlorobenzene	10	ND	10	ND
Benzoic Acid	50	ND	50	ND
2-Chlorophenol	10	ND	10	ND
2,4-Dichlorophenol	10	ND	10	ND

Table cont'd next page ...

February 9, 1993
Bermite Division of Whittaker

LAB No: SP 300449-1
Description: MW10/G,P/18

EPA METHOD 625 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
2,4-Dimethylphenol	10	ND	10	ND
4,6-Dinitro-o-cresol	50	ND	50	ND
2,4-Dinitrophenol	50	ND	50	ND
2-Methylphenol	10	ND	10	ND
4-Methylphenol	10	ND	10	ND
2-Nitrophenol	10	ND	10	ND
4-Nitrophenol	50	ND	50	ND
p-Chloro-m-cresol	20	ND	20	ND
Pentachlorophenol	50	ND	50	ND
Phenol	10	ND	10	ND
2,4,5-Trichlorophenol	10	ND	10	ND
2,4,6-Trichlorophenol	10	ND	10	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB BLANK AR	LAB BLANK % REC.
2-Fluorobiphenyl	34- 99	64	34-99	70
Nitrobenzene-d5	37- 94	63	37-94	64
p-Terphenyl-d14	57- 94	59	57-94	93
2-Fluorophenol	12- 82	47	12-82	25
Phenol-d6	23- 62	29	23-62	49
2,4,6-Tribromophenol	49-102	71	49-102	68

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal H.

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

mlh

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/H/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300449-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Chloride	300.0	mg/L	1	68
Nitrate	300.0	mg/L	0.5	0.5
Sodium	200.7	mg/L	1	82
Sulfate	300.0	mg/L	1	41
Iron	6010	mg/L	0.05	0.05
Manganese	6010	mg/L	0.03	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Darrell H Nelson

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/I/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Phosphorous, Ortho	365.2	mg/L	0.1	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 11, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/K,M/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 8, 1993
QA/QC ID# : 930208 300423-201M

Analytical Results - Dissolved

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Antimony	7041	ug/L	100	ND
Arsenic	7060	ug/L	50	ND
Barium	6010	ug/L	100	ND
Cadmium	7131	ug/L	10	ND
Chromium	7191	ug/L	50	ND
Copper	6010	ug/L	100	ND
Lead	7421	ug/L	50	ND
Mercury	7470	ug/L	1	ND
Selenium	7740	ug/L	10	ND
Silver	7761	ug/L	10	ND
Thallium	7841	ug/L	1000	ND

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C (2) HNO3 pH < 2 Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

FGL ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 10, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Inorganic Analysis

Sampling Site: Bermite 85-01.4
Sample Description: MW10/N/18
Sampled by : Abdun-nur/Bricker
Type of Sample: Monitoring Well

Sampled : January 27, 1993
Received : January 27, 1993
Completed : February 5, 1993
QA/QC ID# : 930205 300445-201I

Analytical Results

CONSTITUENT	EPA METHOD	UNITS	DLR	RESULTS
Fluoride	340.2	mg/L	0.1	0.2

DLR = Detection Limit for Reporting Purposes. ND = Not Detected at or above the DLR.
ug/L = Micrograms Per Liter (ppb) mg/L = Milligrams Per Liter (ppm) mg/kg = Milligrams Per Kilogram
Preservatives: (1) Cool 4°C Containers: (a) Plastic

If you have any questions please call.

FGL ENVIRONMENTAL

Kurt Wilkinson, B.S.
Inorganic Lab Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

KW/DHN:mlh

ENVIRONMENTAL

ANALYTICAL CHEMISTS

February 4, 1993

LAB No: SP 300449-1

Bermite Division of Whittaker
22116 W. Soledad Can. Rd.
Saugus , CA 91350

RE: Organic Analysis
Matrix: Monitoring Well

Sampling Site: Bermite 85-01.4
Sample Description: MW10/0/18
Sampled by : Abdun-nur/Bricker
Container : Glass TFE-Lined Cap
Preservatives:

Sampled : January 27, 1993
Received : January 27, 1993
Extracted : N/A
Analyzed : February 3, 1993
QA/QC ID# : 930203 624-202A

EPA METHOD 624

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Acetone	10	ND	10	ND
Benzene	0.5	ND	0.5	ND
Bromodichloromethane	1	ND	1	ND
Bromoform	1	ND	1	ND
Bromomethane	1	ND	1	ND
Carbon Disulfide	5	ND	5	ND
Carbon Tetrachloride	0.5	ND	0.5	ND
Chlorobenzene	0.5	ND	0.5	ND
Chloroethane	1	ND	1	ND
Chloroform	0.5	ND	0.5	ND
Chloromethane	1	ND	1	ND
Dibromochloromethane	1	ND	1	ND
1,2-Dichlorobenzene	1	ND	1	ND
1,3-Dichlorobenzene	1	ND	1	ND
1,4-Dichlorobenzene	1	ND	1	ND
1,1-Dichloroethane	1	ND	1	ND
1,2-Dichloroethane	1	ND	1	ND
1,1-Dichloroethylene	1	ND	1	ND
trans-1,2-Dichloroethylene	1	ND	1	ND
1,2-Dichloropropane	1	ND	1	ND
cis-1,3-Dichloropropene	2	ND	2	ND
trans-1,3-Dichloropropene	1	ND	1	ND
Ethanol	5,000	ND	5,000	ND

Table cont'd next page ...

February 4, 1993
Bermite Division of Whittaker

LAB No: SP 300449-1
Description: MW10/0/18

EPA METHOD 624 Analysis results Cont'd

CONSTITUENT	SAMPLE DLR ug/L	SAMPLE RESULTS ug/L	LAB DLR ug/L	BLANK RESULTS ug/L
Ethyl Benzene	0.5	ND	0.5	ND
2-Hexanone	5	ND	5	ND
Methylene Chloride	0.5	ND	0.5	ND
2-Butanone (MEK)	10	ND	10	ND
4-Methyl-2-pentanone (MIBK)	5	ND	5	ND
Styrene	1	ND	1	ND
1,1,2,2-Tetrachloroethane	1	ND	1	ND
Tetrachloroethylene	0.5	ND	0.5	ND
Toluene	0.5	ND	0.5	ND
1,1,1-Trichloroethane	0.5	ND	0.5	ND
1,1,2-Trichloroethane	0.5	ND	0.5	ND
Trichloroethylene	1	ND	1	ND
Trichlorofluoromethane	1.5	ND	1.5	ND
Vinyl Acetate	100	ND	100	ND
Vinyl Chloride	0.5	ND	0.5	ND
Xylenes	1	ND	1	ND

SURROGATES	SAMPLE AR	SAMPLE % REC.	LAB AR	BLANK % REC.
1,2-Dichloroethane-d4	61-164	80	61-164	86
Toluene-d8	81-117	98	81-117	96
BFB	62-124	96	62-124	98

DLR = Detection Limit for Reporting Purposes. MCL = Maximum Contaminant Level (--- indicates none determined.)
ug/L = Micrograms Per Liter (ppb) ND = Not Detected at or above the DLR. AR = Acceptable Range

See attached report for QA/QC data. If you have any questions please call.

FGL ENVIRONMENTAL

H. Neal Hutchison, B.S.
Organic Laboratory Manager

Darrell H Nelson

Darrell H. Nelson, B.S.
Laboratory Director

kdm

Clayton
ENVIRONMENTAL CONSULTANTS

Results of Analysis
for
FGL Environmental

Client Reference: SP300437
Clayton Project No. 93012.62

Sample Matrix/Media:	WATER	Date Received:	01/29/93
Preparation Method:	EPA 8315 (Draft)	Date Prepared:	02/02/93
Analysis Method:	EPA 8315 (Draft)	Date Analyzed:	02/03/93

Lab Number	Sample Identification		Date Sampled	Formaldehyde (ug/L)	Detection Limit (ug/L)
01A	1	MW1	01/27/93	<20	20
02A	2	MW2	01/27/93	<20	20
03A	3	MW3	01/27/93	<20	20
04A	4	MW5	01/27/93	<20	20
05A	5	MW6	01/27/93	<20	20
06A	6	MW7	01/27/93	<20	20
07A	7	MW8	01/27/93	<20	20
08A	8	MW9	01/27/93	<20	20
09A	9	MW10	01/27/93	<20	20
10A	METHOD BLANK		--	15[a]	20

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
-- Information not available or not applicable

[a] Actual blank value; sample results have been blank corrected.

APPENDIX H

STATISTICAL ANALYSES

TABLE H-1, Page 1

REPLICATE STATISTICS FOR EIGHTEENTH QUARTER
RCRA GROUNDWATER SAMPLING AND ANALYSIS
Bermite Division, Whittaker Corporation

Well	Date	pH	Hydrogen Ion Conc	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit					0.5	5
MW-1	01/27/93	7.6	2.51E-08	706	0.25	2.5
MW-1	01/27/93	7.7	2.00E-08	708	0.25	2.5
MW-1	01/27/93	7.7	2.00E-08	706	0.25	2.5
MW-1	01/27/93	7.7	2.00E-08	707	0.25	8.0
Population Size		4	4	4	4	4
Mean		7.675	2.12E-08	706.750	0.250	3.875
Standard Deviation		0.050	2.58E-09	0.957	0.000	2.750
Variance		0.003	6.67E-18	0.917	0.000	7.563
Coeff. Variance		0.651	1.22E+01	0.135	0.000	70.968
MW-3	01/27/93	7.6	2.51E-08	637	0.25	2.5
MW-3	01/27/93	7.6	2.51E-08	640	0.25	2.5
MW-3	01/27/93	7.6	2.51E-08	643	0.25	2.5
MW-3	01/27/93	7.6	2.51E-08	639	0.25	2.5
Population Size		4	4	4	4	4
Mean		7.600	2.51E-08	639.750	0.250	2.500
Standard Deviation		0.000	0.00E+00	2.500	0.000	0.000
Variance		0.000	0.00E+00	6.250	0.000	0.000
Coeff. Variance		0.000	0.00E+00	0.391	0.000	0.000
MW-5	01/27/93	7.9	1.26E-08	532	0.25	2.5
MW-5	01/27/93	7.8	1.58E-08	534	0.25	5.0
MW-5	01/27/93	7.8	1.58E-08	536	0.25	2.5
MW-5	01/27/93	7.9	1.26E-08	537	0.25	2.5
Population Size		4	4	4	4	4
Mean		7.850	1.42E-08	534.750	0.250	3.125
Standard Deviation		0.058	1.88E-09	2.217	0.000	1.250
Variance		0.003	3.54E-18	4.917	0.000	1.563
Coeff. Variance		0.735	1.32E+01	0.415	0.000	40.000

TABLE H-1, Page 2

REPLICATE STATISTICS FOR SIXTEENTH QUARTER
RCRA GROUNDWATER SAMPLING AND ANALYSIS
Bermite Division, Whittaker Corporation

Well	Date	pH	Hydrogen Ion Conc	Conductance (umhos/cm)	TOC (mg/l)	TOX (ug/l)
Detection Limit					0.5	5
MW-6	01/27/93	7.8	1.58E-08	542	0.25	2.5
MW-6	01/27/93	7.8	1.58E-08	545	0.25	2.5
MW-6	01/27/93	7.9	1.26E-08	544	0.25	6.0
MW-6	01/27/93	7.8	1.58E-08	546	0.25	2.5
Population Size		4	4	4	4	4
Mean		7.825	1.50E-08	544.250	0.250	3.375
Standard Deviation		0.050	1.63E-09	1.708	0.000	1.750
Variance		0.003	2.66E-18	2.917	0.000	3.063
Coeff. Variance		0.639	1.08E+01	0.314	0.000	51.852
MW-10	01/27/93	8.0	1.00E-08	631	0.25	2.5
MW-10	01/27/93	8.0	1.00E-08	635	0.25	2.5
MW-10	01/27/93	8.0	1.00E-08	635	0.25	2.5
MW-10	01/27/93	8.0	1.00E-08	635	0.25	2.5
Population Size		4	4	4	4	4
Mean		8.000	1.00E-08	634.000	0.250	2.500
Standard Deviation		0.000	2.83E-18	2.000	0.000	0.000
Variance		0.000	8.02E-36	4.000	0.000	0.000
Coeff. Variance		0.000	2.83E-08	0.315	0.000	0.000

Note: All results reported as non-detected have been given a value equal to one-half the detection limit for purposes of statistical calculations, as recommended on page 122 of the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986.

TABLE H-2, PAGE 2

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC CARBON (TOC)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-5	5	4	1.50	0.000	0.000	0.000
	6	4	6.90	3.130	9.797	45.527
	7	4	2.00	0.000	0.000	0.000
	8	4	2.00	0.000	0.000	0.000
	9	4	0.50	0.000	0.000	0.000
	10	4	2.28	0.206	0.043	9.062
	11	4	1.60	0.283	0.080	17.678
	12	4	1.40	0.082	0.007	5.832
	13	4	0.25	0.000	0.000	0.000
	14	4	0.25	0.000	0.000	0.000
	15	4	0.25	0.000	0.000	0.000
	16	4	0.323	0.145	0.021	44.961
	17	4	0.25	0.000	0.000	0.000
	18	4	0.25	0.000	0.000	0.000
MW-6	5	4	1.50	0.000	0.000	0.000
	6	4	1.50	0.000	0.000	0.000
	7	4	2.00	0.000	0.000	0.000
	8	4	2.00	0.000	0.000	0.000
	9	4	0.50	0.000	0.000	0.000
	10	4	2.10	0.245	0.060	11.664
	11	4	1.48	0.236	0.056	16.020
	12	4	1.53	0.050	0.003	3.279
	13	4	0.25	0.000	0.000	0.000
	14	4	0.41	0.325	0.106	78.788
	15	4	0.25	0.000	0.000	0.000
	16	4	0.25	0.000	0.000	0.000
	17	4	0.25	0.000	0.000	0.000
	18	4	0.25	0.000	0.000	0.000
MW-10	14	4	0.25	0.000	0.000	0.000
	15	4	0.25	0.000	0.000	0.000
	16	4	0.25	0.000	0.000	0.000
	17	4	0.25	0.000	0.000	0.000
	18	4	0.25	0.000	0.000	0.000

TABLE H-2

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC CARBON (TOC)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-1	1	4	1.50	0.000	0.000	0.000
	2	4	2.40	1.516	2.297	63.812
	3	4	1.50	0.000	0.000	0.000
	4	4	2.40	1.516	2.297	63.812
	5	4	1.50	0.000	0.000	0.000
	6	4	1.50	0.000	0.000	0.000
	7	4	2.00	0.000	0.000	0.000
	8	4	2.00	0.000	0.000	0.000
	9	4	0.50	0.000	0.000	0.000
	10	4	1.35	0.058	0.003	4.277
	11	4	1.83	1.053	1.109	57.708
	12	4	1.23	0.096	0.009	7.816
	13	0				
	14	4	0.36	0.210	0.044	59.155
	15	4	0.25	0.000	0.000	0.000
	16	4	0.25	0.000	0.000	0.000
	17	4	0.25	0.000	0.000	0.000
	18	4	0.25	0.000	0.000	0.000
MW-3	1	4	1.50	0.000	0.000	0.000
	2	4	1.50	0.000	0.000	0.000
	3	4	1.50	0.000	0.000	0.000
	4	4	1.50	0.000	0.000	0.000
	5	4	1.50	0.000	0.000	0.000
	6	4	7.10	3.471	12.047	48.714
	7	4	2.00	0.000	0.000	0.000
	8	4	2.00	0.000	0.000	0.000
	9	4	0.68	0.350	0.122	51.852
	10	4	2.18	0.263	0.069	12.092
	11	4	2.03	1.053	1.109	52.008
	12	4	1.28	0.126	0.016	9.869
	13	4	0.25	0.000	0.000	0.000
	14	4	0.60	0.000	0.000	0.000
	15	4	0.25	0.000	0.000	0.000
	16	4	0.343	0.185	0.034	54.015
	17	4	0.25	0.000	0.000	0.000
	18	4	0.25	0.000	0.000	0.000

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC CARBON (TOC)

Bermite Division, Whittaker Corporation

Background Wells 1 and 3	
Number of Background Samples (nb)	35
Background Mean	1.355
Background Variance (Sb2)	1.547
MW-5, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	0.250
Sample Variance (Sm2)	0.000
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.044
T-Statistic (t*)	-5.256
Comparison T-Statistic (tc)	1.684
MW-6, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	0.250
Sample Variance (Sm2)	0.000
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.044
T-Statistic (t*)	-5.256
Comparison T-Statistic (tc)	1.684

TABLE H-2, PAGE 4

SUMMARY OF QUARTERLY REPLICATE STAT
TOTAL ORGANIC CARBON (TOC)
Bermite Division, Whittaker Corporation

MW-10, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	0.250
Sample Variance (Sm2)	0.000
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.044
T-Statistic (t*)	-5.256
Comparison T-Statistic (tc)	1.684

NOTES:

The statistics in this table are defined in 40 CFR Part 264, App. IV--Cochran's Approximation to the Behrens-Fisher Students' T-Test.

All values less than the detection limits have been given values equal to one-half the detection limits for purposes of calculation, as recommended on page 122 of the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986.

TABLE H-3

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC HALOGENS (TOX)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-1	1	4	50.0	0.000	0.000	0.000
	2	4	50.0	0.000	0.000	0.000
	3	4	50.0	0.000	0.000	0.000
	4	4	50.0	0.000	0.000	0.000
	5	4	50.0	0.000	0.000	0.000
	6	4	50.0	0.000	0.000	0.000
	7	4	10.0	0.000	0.000	0.000
	8	4	10.0	0.000	0.000	0.000
	9	4	75.0	50.000	2500.000	66.667
	10	4	2.5	0.000	0.000	0.000
	11	4	2.5	0.000	0.000	0.000
	12	4	2.5	0.000	0.000	0.000
	13	0				
	14	4	2.5	0.000	0.000	0.000
	15	4	2.5	0.000	0.000	0.000
	16	4	6.9	6.890	47.473	99.856
	17	4	2.5	0.000	0.000	0.000
	18	4	2.5	0.000	0.000	0.000
MW-3	1	4	258.0	209.359	43831.250	81.305
	2	4	50.0	0.000	0.000	0.000
	3	4	50.0	0.000	0.000	0.000
	4	4	50.0	0.000	0.000	0.000
	5	4	50.0	0.000	0.000	0.000
	6	4	50.0	0.000	0.000	0.000
	7	4	10.0	0.000	0.000	0.000
	8	4	10.0	0.000	0.000	0.000
	9	4	50.0	0.000	0.000	0.000
	10	4	2.5	0.000	0.000	0.000
	11	4	2.5	0.000	0.000	0.000
	12	4	2.5	0.000	0.000	0.000
	13	4	2.5	0.000	0.000	0.000
	14	4	3.3	1.650	2.723	49.624
	15	4	2.5	0.000	0.000	0.000
	16	4	2.5	0.000	0.000	0.000
	17	4	2.5	0.000	0.000	0.000
	18	4	2.5	0.000	0.000	0.000

TABLE H-3, PAGE 2

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC HALOGENS (TOX)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-5	5	4	50.0	0.000	0.000	0.000
	6	4	50.0	0.000	0.000	0.000
	7	4	10.0	0.000	0.000	0.000
	8	4	10.0	0.000	0.000	0.000
	9	4	50.0	0.000	0.000	0.000
	10	4	2.5	0.000	0.000	0.000
	11	4	2.5	0.000	0.000	0.000
	12	4	2.5	0.000	0.000	0.000
	13	4	2.5	0.000	0.000	0.000
	14	4	2.5	0.000	0.000	0.000
	15	4	2.5	0.000	0.000	0.000
	16	4	3.7	2.400	5.760	64.865
	17	4	3.2	1.400	1.960	43.750
	18	4	3.1	1.250	1.563	40.000
MW-6	5	4	50.0	0.000	0.000	0.000
	6	4	50.0	0.000	0.000	0.000
	7	4	10.0	0.000	0.000	0.000
	8	4	10.0	0.000	0.000	0.000
	9	4	50.0	0.000	0.000	0.000
	10	4	2.5	0.000	0.000	0.000
	11	4	2.5	0.000	0.000	0.000
	12	4	2.5	0.000	0.000	0.000
	13	4	2.5	0.000	0.000	0.000
	14	4	10.5	2.030	4.123	19.383
	15	4	2.5	0.000	0.000	0.000
	16	4	2.5	0.000	0.000	0.000
	17	4	2.5	0.000	0.000	0.000
	18	4	3.4	1.750	3.063	51.852
MW-10	14	4	2.5	0.000	0.000	0.000
	15	4	2.5	0.000	0.000	0.000
	16	4	2.5	0.000	0.000	0.000
	17	4	6.6	8.250	68.063	124.528
	18	4	2.5	0.000	0.000	0.000

TABLE H-3, PAGE 3

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC HALOGENS (TOX)
Bermite Division, Whittaker Corporation

Background Wells 1 and 3	
Number of Background Samples (nb)	35
Background Mean	29.140
Background Variance (Sb2)	2147.551
MW-5, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	3.125
Sample Variance (Sm2)	1.563
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.391
Special Weighting (Wb)	61.359
T-Statistic (t*)	-3.311
Comparison T-Statistic (tc)	1.688
MW-6, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	3.375
Sample Variance (Sm2)	3.063
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.766
Special Weighting (Wb)	61.359
T-Statistic (t*)	-3.269
Comparison T-Statistic (tc)	1.692

TABLE H-3, PAGE 4

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR TOTAL ORGANIC HALOGENS (TOX)

Bermite Division, Whittaker Corporation

MW-10, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	2.500
Sample Variance (Sm2)	0.000
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.000
Special Weighting (Wb)	61.359
T-Statistic (t*)	-3.401
Comparison T-Statistic (tc)	1.684

NOTES:

The statistics in this table are defined in 40 CFR Part 264, App. IV--Cochran's Approximation to the Behrens-Fisher Students' T-Test.

All values less than the detection limits have been given values equal to one-half the detection limits for purposes of calculation, as recommended on page 122 of the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986.

TABLE H-4

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR SPECIFIC CONDUCTANCE
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-1	1	4	598	13.519	182.750	2.263
	2	4	572	9.731	94.688	1.702
	3	4	554	6.292	39.583	1.136
	4	4	500	3.031	9.188	0.606
	5	4	524	10.986	120.688	2.096
	6	4	570	6.180	38.188	1.084
	7	4	504	2.500	6.250	0.497
	8	4	530	35.218	1240.333	6.651
	9	4	544	0.000	0.000	0.000
	10	4	573	11.121	123.667	1.942
	11	4	559	0.577	0.333	0.103
	12	4	575	0.957	0.917	0.167
	13	0				
	14	4	639	1.500	2.250	0.235
	15	4	643	1.258	1.583	0.196
	16	4	660	0.000	0.000	0.000
	17	4	676	1.500	2.250	0.222
	18	4	707	0.957	0.917	0.135
MW-3	1	4	699	19.447	378.188	2.783
	2	4	664	23.467	550.688	3.535
	3	4	622	12.121	146.917	1.948
	4	4	661	0.000	0.000	0.000
	5	4	617	1.785	3.188	0.289
	6	4	641	4.493	20.188	0.701
	7	4	590	3.742	14.000	0.634
	8	4	589	17.000	289.000	2.889
	9	4	642	0.000	0.000	0.000
	10	4	656	2.500	6.250	0.381
	11	4	629	0.957	0.917	0.152
	12	4	633	2.944	8.667	0.465
	13	4	642	1.258	1.583	0.196
	14	4	648	2.887	8.333	0.446
	15	4	643	0.577	0.333	0.090
	16	4	643	5.000	25.000	0.778
	17	4	641	0.957	0.917	0.149
	18	4	640	2.500	6.250	0.391

TABLE H-4, PAGE 2

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR
SPECIFIC CONDUCTANCE
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-5	5	4	543	1.299	1.688	0.239
	6	4	578	5.890	34.688	1.019
	7	4	512	3.345	11.188	0.654
	8	4	560	12.961	168.000	2.315
	9	4	544	0.000	0.000	0.000
	10	4	552	4.787	22.917	0.868
	11	4	543	0.816	0.667	0.150
	12	4	544	3.304	10.917	0.607
	13	4	548	1.414	2.000	0.258
	14	4	539	0.500	0.250	0.093
	15	4	538	0.000	0.000	0.000
	16	4	540	0.000	0.000	0.000
	17	4	535	0.500	0.250	0.930
	18	4	535	2.217	4.917	0.415
MW-6	5	4	528	6.418	41.188	1.216
	6	4	578	4.330	18.750	0.750
	7	4	503	4.603	21.188	0.915
	8	4	536	1.500	2.250	0.280
	9	4	541	0.000	0.000	0.000
	10	4	528	10.720	114.917	2.029
	11	4	518	0.500	0.250	0.096
	12	4	519	2.500	6.250	0.481
	13	4	527	1.500	2.250	0.284
	14	4	535	1.141	2.000	0.264
	15	4	531	0.577	0.333	0.109
	16	4	540	0.000	0.000	0.000
	17	4	541	0.957	0.917	0.177
	18	4	544	1.708	2.917	0.314
MW-10	14	4	625	2.062	4.250	0.330
	15	4	636	0.500	0.250	0.079
	16	4	640	0.000	0.000	0.000
	17	4	626	0.957	0.917	0.153
	18	4	634	2.000	4.000	0.315

TABLE H-4, PAGE 3

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR
SPECIFIC CONDUCTANCE
Bermite Division, Whittaker Corporation

Background Wells 1 and 3	
Number of Background Samples (nb)	35
Background Mean	612.129
Background Variance (Sb2)	2853.292

MW-5, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	534.750
Sample Variance (Sm2)	4.917
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	1.229
Special Weighting (Wb)	81.523
T-Statistic (t*)	-8.506
Comparison T-Statistic (tc)	1.694

MW-6, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	544.250
Sample Variance (Sm2)	2.917
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	0.729
Special Weighting (Wb)	81.523
T-Statistic (t*)	-7.484
Comparison T-Statistic (tc)	1.690

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR SPECIFIC CONDUCTANCE

Bermite Division, Whittaker Corporation

MW-10, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	634.000
Sample Variance (Sm2)	4.000
T-Statistic (tm) (Part 264, App. IV)	2.353
T-Statistic (tb) (Part 264, App. IV)	1.684
Special Weighting (Wm)	1.000
Special Weighting (Wb)	81.523
T-Statistic (t*)	2.408
Comparison T-Statistic (tc)	1.692

NOTES:

The statistics in this table are defined in 40 CFR Part 264, App. IV--Cochran's Approximation to the Behrens-Fisher Students' T-Test.

All values less than the detection limits have been given values equal to one-half the detection limits for purposes of calculation, as recommended on page 122 of the RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, September 1986.

TABLE H-5

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR
HYDROGEN ION CONCENTRATION ((10)^-pH)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-1	1	4	3.16E-08	0.00E+00	0.00E+00	0.00
	2	4	3.37E-08	3.55E-09	1.26E-17	10.53
	3	4	6.31E-08	0.00E+00	0.00E+00	0.00
	4	4	3.37E-08	3.55E-09	1.26E-17	10.53
	5	4	2.51E-08	0.00E+00	0.00E+00	0.00
	6	4	3.98E-08	0.00E+00	0.00E+00	0.00
	7	4	2.84E-08	3.25E-09	1.06E-17	11.46
	8	4	5.34E-09	6.50E-10	4.23E-19	12.18
	9	4	4.09E-08	1.07E-08	1.14E-16	26.10
	10	4	3.16E-08	0.00E+00	0.00E+00	0.00
	11	4	2.12E-08	2.58E-09	6.67E-18	12.20
	12	4	4.82E-08	1.11E-08	1.22E-16	22.90
	13	0				
	14	4	3.16E-08	0.00E+00	0.00E+00	0.00
	15	4	3.16E-08	0.00E+00	0.00E+00	0.00
	16	4	2.84E-08	3.76E-09	1.41E-17	13.2
	17	4	2.84E-08	3.76E-09	1.41E-17	13.2
	18	4	2.12E-08	2.58E-09	6.67E-18	12.2
MW-3	1	4	3.37E-08	3.55E-09	1.26E-16	10.53
	2	4	1.97E-08	5.57E-09	3.10E-17	28.32
	3	4	5.01E-08	0.00E+00	0.00E+00	0.00
	4	4	3.16E-08	0.00E+00	0.00E+00	0.00
	5	4	3.00E-08	2.82E-09	7.93E-18	9.39
	6	4	6.72E-08	7.07E-09	5.00E-17	10.50
	7	4	4.75E-08	4.46E-09	1.99E-17	9.39
	8	4	6.07E-09	1.39E-09	1.93E-18	22.92
	9	4	2.38E-08	2.58E-09	6.67E-18	10.80
	10	4	5.43E-08	6.49E-09	4.21E-17	12.20
	11	4	2.84E-08	3.76E-09	1.41E-17	13.20
	12	4	6.07E-08	1.39E-08	1.94E-16	22.90
	13	4	2.25E-08	2.98E-09	8.9E-18	13.20
	14	4	3.57E-08	4.73E-09	2.23E-17	13.20
	15	4	3.16E-08	0.00E+00	0.00E+00	0.00
	16	4	2.84E-08	3.76E-09	1.41E-17	13.2
	17	4	2.84E-08	3.76E-09	1.41E-17	13.2
	18	4	2.51E-08	0.00E+00	0.00E+00	0.00

TABLE H-5, PAGE 2

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR
HYDROGEN ION CONCENTRATION ((10)^-pH)
Bermite Division, Whittaker Corporation

Well	Quarter	Number of Replicates	Mean	Standard Deviation	Variance	Coeff. of Variance
MW-5	5	4	2.38E-08	2.24E-09	5.00E-18	9.39
	6	4	3.16E-08	0.00E+00	0.00E+00	0.00
	7	4	2.51E-08	0.00E+00	0.00E+00	0.00
	8	4	1.00E-08	2.83E-18	8.02E-36	0.00
	9	4	2.02E-08	3.80E-09	1.44E-17	18.80
	10	4	2.51E-08	0.00E+00	0.00E+00	0.00
	11	4	1.24E-08	4.06E-09	1.65E-17	32.70
	12	4	2.00E-08	0.00E+00	0.00E+00	0.00
	13	4	1.26E-08	0.00E+00	0.00E+00	0.00
	14	4	1.58E-08	0.00E+00	0.00E+00	0.00
	15	4	2.00E-08	0.00E+00	0.00E+00	0.00
	16	4	2.00E-08	0.00E+00	0.00E+00	0.00
	17	4	1.79E-08	2.37E-09	5.61E-18	13.2
	18	4	1.42E-08	1.88E-09	3.54E-18	13.2
MW-6	5	4	2.00E-08	0.00E+00	0.00E+00	0.00
	6	4	2.15E-08	3.89E-09	1.51E-17	18.10
	7	4	2.38E-08	2.24E-09	5.00E-18	9.39
	8	4	1.20E-08	1.30E-09	1.69E-18	0.00
	9	4	1.89E-08	2.05E-09	4.21E-18	10.80
	10	4	2.51E-08	0.00E+00	0.00E+00	0.00
	11	4	1.03E-08	2.68E-09	7.2E-18	26.10
	12	4	2.00E-08	0.00E+00	0.00E+00	0.00
	13	4	1.19E-08	1.29E-09	1.68E-18	10.80
	14	4	2.51E-08	0.00E+00	0.00E+00	0.00
	15	4	2.00E-08	0.00E+00	0.00E+00	0.00
	16	4	1.69E-08	2.05E-09	4.21E-18	12.2
	17	4	2.00E-08	0.00E+00	0.00E+00	0.00
	18	4	1.5E-08	1.63E-09	2.66E-18	10.8
MW-10	14	4	1.69E-08	2.05E-09	4.21E-18	12.20
	15	4	1.58E-08	0.00E+00	0.00E+00	0.00
	16	4	1.58E-08	0.00E+00	0.00E+00	0.00
	17	4	1.34E-08	1.63E-09	2.66E-18	12.2
	18	4	1E-08	2.83E-18	8.02E-36	2.83E-08

TABLE H-5, PAGE 3

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR HYDROGEN ION CONCENTRATION

Bermite Division, Whittaker Corporation

Background Wells 1 and 3	
Number of Background Samples (nb)	35
Background Mean	3.34E-08
Background Variance (Sb2)	1.93E-16

MW-5, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	1.42E-08
Sample Variance (Sm2)	3.54E-18
T-Statistic (tm) (Part 264, App. IV)	3.182
T-Statistic (tb) (Part 264, App. IV)	2.021
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.000
T-Statistic (t*)	-7.589
Comparison T-Statistic (tc)	2.182

MW-6, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	1.50E-08
Sample Variance (Sm2)	2.66E-18
T-Statistic (tm) (Part 264, App. IV)	3.182
T-Statistic (tb) (Part 264, App. IV)	2.021
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.000
T-Statistic (t*)	-7.401
Comparison T-Statistic (tc)	2.146

TABLE H-5, PAGE 4

SUMMARY OF QUARTERLY REPLICATE STATISTICS FOR HYDROGEN ION CONCENTRATION
Bermite Division, Whittaker Corporation

MW-10, Quarter 18	
Number of Samples (nm)	4
Sample Mean (Xm)	1.00E-08
Sample Variance (Sm2)	8.02E-36
T-Statistic (tm) (Part 264, App. IV)	3.182
T-Statistic (tb) (Part 264, App. IV)	2.021
Special Weighting (Wm)	0.000
Special Weighting (Wb)	0.000
T-Statistic (t*)	-9.965
Comparison T-Statistic (tc)	2.021

NOTES:

The statistics in this table are defined in 40 CFR Part 264, App. IV--Cochran's Approximation to the Behrens-Fisher Students' T-Test.

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